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An Address

BEFORE THE

CANADIAN TUBERCULOSIS ASSOCIATION*

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Gravenhurst

FOR the first time we have to-day the honour and pleasure of welcoming His Excellency, The Lord Byng of Vimy, to one of our meetings.

Since its inception all the Governors-General of Canada have shown cordial interest in the work of the Association. Each in turn has consented to become Honorary President, all have honoured the annual meetings held in Ottawa by their attendance, and in the formative days a number of executive meetings were held in the presence of His Excellency, the Earl of Minto.

It will be of interest to many here to learn that a letter from the late King, then Prince of Wales, to His Excellency, the Governor-General, in the year 1900, inquiring into the state of health in this country, was the inspiration that gave rise to the formation of the Canadian Association for the Prevention of Consumption and other Forms of Tuberculosis. Two years previously the Prince of Wales had presided at the inauguration of the National Association of Great Britain.

His Excellency, Lord Minto, commanded a group of gentlemen to meet him at Rideau Hall with a view to forming a national body to combat tuberculosis. These were the late Mr. W. C. Edwards (later Senator Edwards), the late Mr. J. M. Courtney, Dr. H. Beaumont Small, Dr. F. Montizambert, Dr. Roddick from Montreal (later Sir Thomas), Sir James Grant, Dr. Sweetland, Mr. Perley (later Sir George), Prof. J. W. Robertson and Dr. R. W. Powell, with a few others. This group formed a committee and added other members.

Early in 1901 a formal meeting of the committee was held and the Association officially organized. The officers then elected were: His Excellency, the Earl of Minto, Honorary President; Sir James A. Grant, M.D., K.C.M.G., President; Mr. J. M. Courtney, C.M.G., Honorary Treasurer; Dr. H. Beaumont Small, Honorary Secretary; and an Executive Council broadly representing health interests throughout Canada. Mr. Courtney was the moving factor in the early days of the organization of the Association.

The original name of the Association fairly defined its objects, outlined by the constitution, and the broad principles of action therein given at once became effective through the practical measures taken. The Association has consistently developed a broadening campaign of education by means of its publications, which reach the general public and the medical profession; has at the same time materially lessened the phthisiophobia of early days; has furthered and in a number of instances has initiated the enactment of legislation, federal, provincial and municipal, relating to immigration, health and sanitation in general, and the prevention of tuberculosis; has promoted the formation of branch associations and thereby

*Presidential Address at Annual Meeting of the Canadian Tuberculosis Association, Ottawa, April, 1924.

developed support to the campaign; has incited constructive undertakings in a number of instances; has, where desired, assisted all local effort in its organization for providing practical means of combatting the disease by supervision and in the establishment of sanatoria and clinics; has initiated investigation into the actual health conditions prevailing in selected communities; has assembled statistics and general information relating to tuberculosis and made this accessible and helpful to all enquirers; and has been a sympathetic link between the several provinces in matters of common interest.

The records of the early years show plainly the interest and influence of Dr. Small, the Honorary Secretary for the first three years, and it is a great satisfaction to have him still on our Executive Council, as deeply interested in the welfare of the Association as in the days now long passed. It is gratifying to have Dr. Montizambert, a member of the Executive Council from the beginning, also maintain his active interest in the Association to which he has given so much help.

When we consider the difficulties that faced the Association from the first, it must be recognized that it has undoubtedly accomplished a great deal. The membership was small, composed of a few altruistic men from all the provinces of Canada, scattered throughout an enormous territory, the incentives and opportunities for meetings few and the funds meagre. The inertia to be overcome in the separate communities was great and the force that could be applied too small to develop quickly any considerable momentum to the campaign.

A campaign for subscriptions from the public with which to finance the Association was recognized as futile since the cause was undramatic and the cost would be great. This point of view still obtains. The few subscriptions, and later the collections made by the first Field Secretary dropped off as local enterprises developed. Apart from the original donation of $1,000 that helped the Association to start, miscellaneous collections never reached $300 in any one year. Wealthy people failed to notice the appeals urged through the widely circulated annual reports. The Dominion Government's help was essential if this national body was to live and function. For administrative uses a grant of $1,000 was made in the third year, then of $2,000 for four years, of $5,000 for three years, of $10,000 for twelve years, and of $15,000 for the past two years. Since 1921 the Canadian Red Cross Society, some of its provincial divisions, the Dominion Government and some of the Provincial Governments have contributed to special work undertaken by the Association.

Meetings for the first eight years were held only in Ottawa. It was expedient that the policy of the Association should become moulded by its founders. Moreover, there was the ever-present hope that the Dominion Government could be convinced of its responsibility and would undertake effective measures to further prevention and cure. When both the House of Commons and the Senate resolved in 1905 that "the time has arrived when Parliament should take some active steps to lessen the widespread suffering and great mortality among the people of Canada caused by the various forms of tuberculosis," great hopes for the immediate future were entertained, but these were doomed to disappointment by the evasion of the issue through the invocation of the British North America Act.

Since 1908 the annual meeting has only four times been held in Ottawa although the permanent headquarters of the Association and the many executive meetings held here serve to keep our interest concentrated properly at the seat of government.

The change of place of the annual meeting to points where anti-tuberculosis effort was active undoubtedly brought the Association into a closer relationship with local bodies, and better knowledge, broader sympathies and greater harmony resulted. Now came a time of great activity and enthusiasm. The results of eight long years of patient effort were beginning to show in the activities of different groups of social workers in health problems and in the sanatoria now developed or being developed in many places. The character of the meetings became modified by the great increase of sociological material presented and a relative enlargement of the medical programme due to the increasing interest of the medical profession, stimulated by the President and Secretary who were then both physicians—Professor J. G. Adami and Dr. G. D. Porter.

The meetings were also timed to coincide with important medical and health conferences and a larger attendance of medical men was thus secured. The National Council of Women and the Imperial Order of the Daughters of the Empire became active co-operators in the affairs of the Association, besides becoming great supporters of local associations and institutions. They gave a great impetus and support to the work. When the Great War intervened the effectiveness of the Association had become fairly recognized by the Press and public associations.

At the beginning of the century when the Association was formed there were three sanatoria in Canada with less than two hundred beds, whereas there were thirty sanatoria with eighteen hundred beds in seven of the provinces when war for a time suspended constructive effort.

The war brought the long wished for participation of the Dominion Government in sanatorium affairs. The capacity of existing sanatoria was thereby doubled, by the construction of accommodation for two thousand beds by the end of 1919. The Government had confidence in the organizations already experienced in sanatorium management and recognized that the money spent would be invested in going concerns and would continue to be useful to civilians after war needs had passed. No wiser solution of the problem could have been made. The increased capacity and efficiency of the institutions thus enlarged could scarcely have been attained in a decade or more in time of peace. After the conclusion of the war the Canadian Red Cross Society became an effective co-operator with the Association through its peace-time programme. The aid thus given has greatly enlarged the field of usefulness of the Association.

The success of the Association's work in the past should be rated by the growth of the whole anti-tuberculosis movement in Canada. The Association owes much to the ten past presidents for their initiative and co-operation in furthering its development, and to the many energetic members who made real sacrifices in coming repeatedly great distances to help the work along. The sustained interest and steady expansion of the field has been especially due to our secretaries, the late Rev. E. B. Eby, D.D., the late Rev. Wm. Moore, D.D., and Dr. G. D. Porter. Dr. Eby gave freely of his time during the first two organizing years. Dr. Moore and Dr. Porter initiated interest by their wide and repeated travels throughout Canada. The reports of meetings record frequent appreciation by delegates from the various provinces of the inspiration and help given by them. Twice, coincident with the change of secretaries, the name of the Association has been simplified for the sake of convenience; in 1909 when Dr. Porter was appointed, and in 1922 shortly after Dr. Wodehouse succeeded him.

In 1901 when the Association began its work the death rate from all forms of tuberculosis throughout Canada was 180 per 100,000, or 9,600 deaths for a population of 5,400,000, while 20 years later the rate was 87 or 7,700 deaths for a population of 8,800,000. During the two decades while the population increased 63%, the deaths decreased 20% in actual numbers, and the death rate 52%. In the general decline of the tuberculosis death rate all the influences that have improved health and which have become effective during the past quarter of a century, have played a part, but those growing out of the antituberculosis campaign may claim a fair share of credit. The effect of all these measures is probably increasing as time passes. Since 1918 the influence of the influenza epidemic has been shown by a more marked decline.

In the several cities where an intensive health campaign has been waged, the results are even more striking. Toronto's reduction of 72% in the death rate in twenty-one years is amazing, the population meanwhile having increased 150%. Hamilton effected a reduction of 52% in twenty years with an increase in population of 122%; (a death rate of 40 is claimed in Hamilton for 1923; a reduction of 33% in the past two years).

Since the National Sanatorium Association opened the first sanatorium in Canada in 1897 with twenty-five beds, twenty-nine such institutions have been built and are now operating in eight provinces with 4,343 beds. Several temporary institutions have also been closed as war needs lessened. One bed is available for 2,024 of population, and 56 for each

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100 deaths. Manitoba and Ontario have as many beds as there are deaths annually.

This great provision for treatment has cost $10,000,000, of which the Dominion Government contributed $3,500,000 during and after the war. The greater part of the $4,000,000 spent before the war was obtained through public subscriptions, and another $2,000,000 mostly from voluntary contributions, has been spent since the war expansion was completed. Accommodation for nearly 700 beds now being built will cost about $1,300,000.

In five provinces 10% of beds in hospitals receiving Provincial Government grants are available for treatment, but there is reason to think that in some of these the hospitality is reluctant and that it is difficult for patients to gain admission even when in need of urgent surgical treatment. Special accommodation has been provided in nine Hospitals for the Insane. There are also more than sixty clinics for diagnosis scattered throughout the provinces.

In the early autumn of 1923 the Association lost through death one of the earliest members of the Executive Council, Dr. Gordon Bell, Provincial Medical Officer of Health of Manitoba, and Professor of Bacteriology of the University of Manitoba. Dr. Bell was frequent in his attendance at these meetings and deeply interested. He was instrumental in creating the voluntary organization in Manitoba which has done everything for the splendid anti-tuberculosis movement in that province. No man, it has been said, has done greater work for medicine in the western provinces than Dr. Bell. This Association deeply regrets his loss.

The Quarterly Bulletin and the Review of the Fiscal Year already issued have informed most members of the activities of the Association during the past year, and I shall refer to them but briefly. Now as in the past the functions of the Association are to educate, agitate, stimulate, co-ordinate and co-operate, with no wish on its part to interfere with local efforts, nor to embarrass them financially by making any local appeal for funds. The effectiveness of our work is due to the infectious enthusiasm and energy of our Secretary, Dr. R. E. Wodehouse, which, widely disseminated in his wide travels and through his extensive correspondence, have stimulated all interested in the compaign.

Professor W. Lyle Cummins, C.B., C.M.G., LL.D., of the King Edward VII. Welsh National Memorial Association, Cardiff, Wales, has accepted an invitation to address a meeting of the Canadian Medical Association in June on behalf of this Association. Afterwards, accompanied by Dr. Wodehouse, he will make an extensive tour of all the Provinces in the interest of our work. We may congratulate ourselves on having been able to induce Professor Cummins to make this journey in order that we should thus bring a British point of view to bear upon anti-tuberculosis work in Canada. The Red Cross grant has made this visit possible.

In accordance with the custom that has obtained at most previous meetings we shall be addressed this evening by a distinguished guest from the United States, Dr. Francis Trudeau of Saranac Lake, who will speak to us of the life and work of his famous and widely beloved father. Dr. Edward Livingstone Trudeau, known to many here to-day, was and continues to be an inspiration to all workers in this field, like whom there is no other.

Two researches relating to the cure of tuberculosis have received much notice from the press during the past year, viz.: Mr. H. Spahlinger's treatment by serum and vaccine and Professor Georges Dreyer's modified tuberculin. Neither of these researches have warranted the newspaper notoriety they have received, and it is cruel to the tuberculous patients throughout the land to buoy up hopes in advance in methods of treatment yet untested, and when the materials for such treatment can not be obtained.

For many years occasional medical students have worked in sanatoria for varying periods. About fifteen years ago Sir William Gage offered several competitive scholarships and medals to undergraduates in medicine, which entailed upon the candidates a brief period of residence in a sanatorium. Two years ago this Association formally expressed approval of the co-operation between the Manitoba University Medical School and the Manitoba Sanatorium in affording a training in tuberculosis work for undergraduates, and suggested that the plan should be brought to the attention of other universities with the hope that it might be found widely practicable. In order to test the feeling held by the faculties of the universities and the sanatorium directors in regard to this suggestion, a symposium on the subject

has been arranged for this afternoon. The representatives invited to present this subject have been chosen because of their intimate knowledge of actual conditions and possibilities. We hope very much that the practicability of using a large number of beds and a considerable experience may be demonstrated. If an adverse decision is unfortunately reached this Association can at least feel that its responsibility in the matter has ceased.

The Association's principles compel it to follow an opportunist policy of furthering local effort and helping to meet local needs as they arise. A practical measure which we should develop further by all means in our power is the diagnostic clinic. It is understood that a diagnostic clinic implies not only the work of a physician, but the co-ordinated work of a Social Service nurse, not only in the clinic, but in the community. There are two pressing reasons for this development:—(1) the diagnosis of early cases, and the re-claiming, if possible, of those who are advanced and whose treatment has been neglected; (2) the economic use of the accommodation provided in sanatoria, and that which it is hoped will be added in the future. From the earliest days of the movement, the need of early diagnosis of tuberculosis has been everywhere emphasized. This has led to the establishment of clinics, limited to centres as a rule where organized effort has developed, then to Social Service nurses, and now to travelling clinics and sanatorium extension clinics. The clinics conducted by the medical staffs of the Saskatchewan, Hamilton, and London sanatoria, and of the sanatoria of the National Sanatorium Association, have shown and proved their value in localities more or less distant from the sanatoria. The death rates have been less reduced in the smaller towns and in the country than in the larger cities where a more intensive campaign has been carried on. It is in the smaller towns and in the country districts that intensive work is now most necessary. Economy requires that the great capital expenditure made upon the enlargement of sanatoria should be fully used by the constant occupation of all beds provided, and that maintenance cost should be thereby reduced.

For a time after war needs had decreased, the accommodation in the sanatoria was not fully taken up by civilians. Since the clinics have been established the beds have been better filled, but infirmary accommodation is relatively lacking, and the empty beds now are those only suitable for ambulant patients. In Canada ten or twelve thousand people scattered throughout city, town, and country fall ill each year from tuberculosis. Besides these there are sixty thousand patients living with active disease previously acquired, and rather more than this number with disease no longer active. We have only 4,300 beds in sanatoria with which to treat these cases, yet the patients are at times not forthcoming in sufficient numbers to keep the beds, especially for early cases, filled. This is surely an extraordinary situation. The explanations are that the cases are not found; when found, the need for sanatorium treatment is not sufficiently impressed upon the patients in order to overcome their resistance to institutional care and to encourage them to be willing to make the pecuniary sacrifice for it. Moreover, in some provinces the public, that is, the Provincial and Municipal Governments—has not made sufficiently generous provision to meet the present day relatively high maintenance cost for those who are indigent or who can ill afford to pay. On humanitarian and hygienic grounds cases must be treated; on economic grounds they should be treated; for all three reasons they must be found.

Voluntary organizations like the Health and Sanatorium Associations have taken the lead in this matter; it is inevitable that they should do so, and desirable that they should continually broaden their field of usefulness to reach apathetic or unorganized communities, especially in the rural districts where there is the greatest neglect. In order that such associations may function more freely and develop new fields, they should be relieved entirely of the financial burden of the upkeep of the sanatoria for treatment that their altruistic efforts have brought upon them. It is the function of such philanthropic bodies to create the measures required to meet the urgent needs of public health, where no such measures have existed, but once their need and efficiency have been amply demonstrated, the public at large should reasonably be expected to assume the cost of maintenance of methods of treatment which are as effective in protecting the well as

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in helping the ill. Our former President, Mr. A. B. Cook, two years ago forcibly developed the question of Government responsibility in this matter. In his opinion no human responsibility has been so persistently passed from one authority to another as the care of the unfortunate tuberculous patient.

Wherever such clinics, with supervisory adjuncts, are established, it is highly desirable that an energetic association of women should be formed in order to support the work of the clinic, and to aid the dependents of the patient. Many patients delay treatment because they are obliged to carry on to the limit of their working capacity in order to support or care for their families. An early case may thus easily become a hopeless one. Wherever anti-tuberculosis work has been established, the women of the community have been essential to its success. Splendid examples of their altruistic work are to be found in the Heather, Samaritan, and May Court Clubs of Toronto and Ottawa.

Some western provinces and some municipalities which have sanatoria in the neighbourhood, in Ontario at least, and probably elsewhere, are burdened unfairly by being obliged to become responsible for the maintenance of patients who do not properly belong to the province or municipality. The feeling grows steadily stronger that all relatively indigent patients should become a full provincial charge. The cost would be fairly equitably borne. In Ontario, for example, the distribution of population for 1921 was 40% in city, 5% in town, and 55% rural, while the distribution of deaths from tuberculosis was 37% in city, 7% in town, and 56% rural. Those cities where the campaign has already been waged most effectively might possibly be placed at some slight disadvantage if the province should assume the full cost of such patients.

For the past two years tuberculosis amongst the Indians has been earnestly considered by the Association. There are upwards of 100,000 Indians in Canada, but statistical information in regard to the amount of tuberculosis amongst them is at present incomplete. The Department of Indian Affairs is endeavouring to obtain the desired information regarding actual conditions, and is cordial in promising practical measures of relief. There should, however, be no delay in instituting prophylactic instruction in the settlements. Specially qualified nurses could visit the various villages for the purpose of instructing young Indian women in hygiene in order that they may teach their own people. These nurses should revisit the settlements regularly in order to supervise and strengthen the local teachers. This very practical and relatively inexpensive plan for immediate relief was long ago suggested by the Lord Archbishop of Algoma.

The care of the tuberculous patient who has made a relative recovery, for whom intensive treatment is no longer necessary, and in many cases no longer possible, is the most difficult task for anti-tuberculosis workers to-day. While one of the most vital of all requirements in a successful anti-tuberculosis campaign it has, because of its inherent difficulties, been that most neglected. It involves medical supervision, a supervising social service and the creation of opportunities for employment within the physical efficiency of the individual. The Dominion Government surveyed this problem three years ago insofar as it related to ex-service men and was impressed with the need of its solution in their interest. It established a fairly effective follow-up service throughout the country in the matter of supervision by its out-patient clinics, pension board examining offices, social service nurses, and employment bureaus, but it was unwilling to take the full responsibility of establishing opportunities for sheltered employment. The Government was anxious to co-operate with any suitable administrative organization in creating effective opportunities for such employment and subsidizing them. It looked to this Association to co-ordinate if possible various suitable administrative bodies in a great reconstructive effort which might possibly benefit both ex-service men and civilians. It emphasized the fact that unless the opportunity were seized at once it would be lost forever. The Association resolved to make every effort to bring about the co-operation of the agencies desired, but if no practical results have followed there is sufficient explanation for our failure in the size and complexity of the problem, and the impossibility of the executive office, restricted as to personnel and funds, being able to create the necessary sentiment in a

limited time. The Canadian Red Cross Society did undertake to co-operate with the Government and established substandard workshops for ex-service men only, but the four established exclude the tuberculous man. The Department of Soldiers' Civil Re-establishment, however, operates five workshops in which the tuberculous have an opportunity to work. Dr. Dobbie and Dr. Porter will this afternoon discuss the practicability of interesting the numerous Branch Associations, formed long ago, in this subject. Since the agitation for building sanatoria has lessened, it is possible that to-day they may again become active and help solve this difficult problem.

For the past two years the Executive Council has wished to further research in tuberculosis from the laboratory standpoint. While realizing that valuable work of the kind had been done in Canada, the need of enlarging this field has long been recognized. Research may almost be regarded as the spiritual side of medicine. It is the faith in the future to be revealed by endeavour. It is "the substance of things hoped for, the evidence of things not seen." For, although we now see through a glass darkly, we cherish always the hope that some material may be found because of carefully planned investigations that will cure or hasten the cure of tuberculosis. It is impossible that such a thing will be found in any other way. There are besides many problems relating to tuberculosis which, if solved, will greatly enlarge our understanding of this disease, but investigators must be trained and they must have facilities. We have in Canada fair facilities, a few men capable of supervising such work, and men here or elsewhere can be found who will wish to undertake it. The knowledge that this type of work is being done in Canada would be a great stimulus to all working here, especially in the medical, apart from the sociological field of tuberculosis. It would intensify interest in reading in order to keep abreast of research medicine. Through familiarity with the problems being studied, research would develop in other smaller laboratories, especially in those of the sanatoria. This might be quite original or else suggested from the central laboratories and co-ordinated with the work there. This new interest would add much to the intellectual life of the sanatoria, now stultified by a laborious and, often, too monotonous routine and it would also improve the quality of the clinical work. For such research to be made possible and worth while, sufficient funds must be found to insure the continuance of the work in a generous manner over a long period—say ten years—in order to attract the right type of investigators and to get a foothold in the right kind of laboratory. The benefit to the institution that would co-operate is plain and a reasonable matching of expenditure might be expected. At least $50,000 should be assured to carry on this work.

The lively interest in the anti-tuberculosis movement now shown at many centres throughout Canada gives reason for hope that unceasing effort on the part of the Association will ultimately arouse communities still apathetic. In some provinces the interest is keen and widespread, and the provision for relief fairly generous; in others, even with fair interest, the provision for the indigent is quite inadequate. With limited resources the Association itself can initiate but few enterprises in any one year and it cannot carry through any without the co-operation of enthusiastic local effort. You will hear this afternoon what interesting and valuable work is now under way, thanks to such hearty co-operation. We are confident that our aims are practical and worthy of support and that the needed financial assistance for making them effective will be forthcoming.

The Surgical Treatment of Adherent Pericardium.—H. M. Marvin and Samuel C. Harvey, New Haven, Conn., feel that the operation of cardiolysis constitutes a very valuable therapeutic measure, and one that should be kept in mind by internists and surgeons. The case here reported illustrates the relief that the operation of cardiolysis (Bauer) may afford to patients with adherent pericardium and heart failure. This appears to be the sixth case reported in this country.—*Jour. Am. Med. Ass.*, May 10, 1924.

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AN IMPROVED METHOD OF LUNG PERCUSSION*

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THIS paper deals with certain ideas in regard to percussion of the lungs that have been helpful to me in more accurately defining changes, and in more fully visualizing the pathological condition underlying these changes.

As ordinarily done, percussion consists in comparing the note on one side of the chest with a note at a corresponding point on the other side. Herein lies a possible source of error. The right lung is different in many respects from the left; it is three lobed, has greater capacity, and is situated over a solid organ, the liver. The left lung, on the other hand, is two lobed, of lesser capacity, and has practically embedded in it a solid organ, the heart, with the stomach below. With these differences percussion cannot elicit notes that permit of accurate comparison. The method that I shall presently describe enables one to percuss the one lung without reference to the other. It consists essentially in establishing a basic note of resonance in one lung with which all other notes in any other part of that lung can be compared .

With the patient preferably in a sitting posture on a revolving stool one percusses over the whole lung with extremely light strokes against the distal phalanx of the pleximeter finger until one finds the most resonant note. This is the basic note. Mark this point X with a pencil, and visualize radii passing from it in all directions over the surface of the chest. Holding the pleximeter finger on the line of a radius and percussing very lightly, proceed in short advances, using one stroke to each move. At the first rise in pitch that the ear detects, a short line is drawn on the skin at a right angle to the radius. It is here that the novice finds difficulty. He does not accept quickly enough the tonal change, or rise in pitch, and probably having in mind the sharp line of tonal demarcation as to be found in lobar pneumonia, he is apt to cross the line and lose the advantage of the test. Having completed the first radius, a second is dealt with in a similar manner, and so on throughout the set. When all the radii have been completed, it will be found on the joining of all the short markings that there is a definite line established, and that one has a tonal contour of the basic note of the lung resonance.

The construction of a contour line in this way is helpful in many ways. By the old method one was satisfied to establish merely impaired resonance, or a flat note. It was used chiefly to define the margins of adjacent organs such as the heart, or a line of demarcation as in lobar pneumonia, or fluid level in pleurisy with effusion, and to demonstrate the expansion of the lungs. By this present method one obtains all that was got by the old method and in addition information that could not be so secured. In children with enlarged mediastinal glands it is possible to practically demonstrate the widened interpulmonary space, and even to map out groups of enlarged pulmonary glands. The contour has often bounded a circular or oval area of higher pitched resonance that proved to be the site of abscess of the lung. It is especially valuable in defining adhesions of the pleura, and in pneumothorax to show the size of the air containing cavity, as well as adherent lung. Hilum infiltrations throw definite curves, and localized empyemas can be mapped with fair accuracy.

But the method is especially valuable in outlining changes in pulmonary tuberculosis where so often there is such a variable degree of density of the diseased lung tissue. Working in this way one can show the location of very moderate infiltrations and their extensions into the various bronchial distributions. In other words, the great value of this method

*Read at the Conference of Sanitarium Medical Superintendents, D.S.C.R., Ottawa, April 9, 1924.

is that if one carefully defines the contour of resonance we must come upon all deviations within the lung.

Let me say in conclusion that I know you will understand that I am not trying to take percussion out of its proper place, but simply attempting to show how this part of the physical examination of the lungs can be bettered.

TECHNIQUE AND RESULTS OF A CONCENTRATION METHOD OF SPUTUM EXAMINATION*

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The Queen Alexandra Sanatorium, Byron, Ont.

IT is agreed that the only positive evidence of tuberculous disease is the demonstration of the tubercle bacillus. It is also recognized that bacilli, to be demonstrated by the usual direct smear method, must be present in abundance; Pottenger has estimated that 2,000 to the cubic millimeter are necessary. When we consider the minute amount of material that we actually see during an immersion lens study, this is not surprising, and it will be agreed that our chances of finding the bacilli must be mathematically small, unless they are present in considerable numbers.

We have all made many diagnoses of clinical tuberculosis without the conclusive evidence of bacillary demonstration. The number of these of course varies with the predominating stage of the disease; and also with the number of examinations, and the time and care given to the search. In the Queen Alexandra Sanatorium where we have, I think, an unusual predominance of early and less clear cut clinical material, 60% of the diagnoses at a given time were unconfirmed by bacillary demonstration.

Of improvements on the direct smear method we have, guinea-pig inoculation and a concentration of the bacilli into a smaller amount of sputum. The former has the disadvantage among others, of being time consuming, expensive and troublesome; while numerous methods of concentrating the bacilli into smaller bulk of fluid have been reported in the literature of the past few years, by the use of which the authors claim an increase of 3 to 4 times the number of organisms, but only a slight increase of positives over the direct method. None of these methods have, however, become popular or generally used. In our own laboratory we have tried the various methods from time to time with disappointing results. Concentration has not been regular and distribution was usually poor. We have on occasions failed to recover the organisms from specimens positive by the direct method. Also we have frequently found the staining properties of the organisms so impaired as to make identification difficult.

The principle underlying most of the attempts at bacillary concentration, is that of a solution of the material with caustic agents (acid-fast bacilli escaping destruction by virtue of their waxy capsule) and separation of the organisms by sedimentation.

The method we have found successful follows these same lines, but adopts the principle as used by Kinyoun and others of separating the bacilli from the dissolved specimen with the help of one of the volatile hydrocarbons. We claim nothing original for the method. Its chief virtue lies in the fact that it is the end result of a fairly extensive systematic study of the various previous methods, reagents and details of technique. Credit for this work is due in great measure to one of our medical students, Mr. H. E. MacMahon, who spent many hours of the hardest study on the problem.

Technique.—Briefly the technique consists in (1) dissolving the material with one or two volumes of ½% sodium hydroxide solution (according to viscosity) in a water bath not to exceed 70° C. This is usually accomplished within one half hour, if the specimen is vigorously shaken at intervals. (2) Add 3% of chloroform and shake vigorously for twenty minutes. A

*Read at the Conference of Sanitarium Medical Superintendents D.S.C.R., Ottawa, April 1924.

This paper is published also simultaneously in the American Journal of Tuberculosis.

mechanical shaker is necessary if more than an occasional specimen is to be examined. (3) Centrifuge fairly rapidly for twenty minutes; pipette off the supernatant fluid and make smears from sediment. The entire sediment from a several days' specimen may be usually placed on two or three slides.

The advantage of these particular details over other methods appear to be as follows:

1.—In the use of a weak alkali, which though giving adequate solution causes minimal damage to the organisms.

2.—In the use of chloroform which after many comparative tests in our hands, has given much greater concentration than other hydrocarbon such as gasoline, ligroin, acetone, etc. There is probably also a mechanical factor in its action, as the chloroform sediment instead of being clear as are those from other hydrocarbons, is muddy in appearance, apparently increasing its viscosity and carrying down more bacilli.

3.—The shaking results in even distribution, *i.e.*, each field contains approximately the same number of bacteria. As shown by Pottenger, this is of almost equal importance to concentration, in mathematically increasing our chances of discovering bacilli.

4.—Sedimentation even after standing for 48 hours, has been found to give definitely less concentration than rapid centrifuging. By any other method bacilli may be found in the supernatant fluid.

5.—Very thick preparations may be made without impairing visibility, which of course, increases concentration and lessens time of search.

Results.—1.—A preliminary series of specimens positive by the direct method, invariably showed the organisms in great numbers, and with good distribution and staining properties.

2.—A second group from patients who had shown bacilli by the direct method from three months to three years previously but negative in the meantime, were practically all positive by this method of concentration. We have seen only two out of probably one hundred that have been negative after concentration when positive by the direct method at any previous time up to three years.

3.—Of clinically tuberculous subjects in whose sputum bacilli had never been demonstrated after from ten to forty direct method searches (with an average of 14) 58% were positive by concentration. Wherever such findings were not reasonably confirmed by the clinical data, second and sometimes third tests were performed. Rarely have we been unable to substantiate an original positive finding.

This figure of 58% we feel, however, is misleading, and does not represent the increase in positives that may be expected among average tuberculous material. The work from which this figure was extracted was performed exclusively on cases treated in institutions and ignores the considerable numbers who were adjudged minimal or non active, and accordingly not treated, during the same period. The cases treated in institutions naturally represent the sicker class and can be accordingly expected to run a relatively higher percentage of positives. In our routine admission work since then the percentage of positives has been much less.

A control series of guinea pig inoculations was performed. Forty-seven successful inoculations were attained out of an attempted 50, three dying of sepsis. One cubic centimetre of untreated sputum was inoculated, the remainder of the specimen being concentrated. Specimens were previously shaken in the mechanical shaker in an effort to ensure rough distribution. Twenty-four specimens negative by concentration gave negative results when tested on guinea pigs. Twenty-three specimens positive by concentration (although negative by direct method at least ten times) gave nineteen positive guinea pig tests and four negatives. In other words, in four specimens in which acid fast bacilli were thought to be present by concentration, the animals failed to corroborate.

Possible explanations of these discrepancies may be:

1.—Contamination of specimen or slide after material for inoculation was separated.

2.—Organisms incorrectly indentified as tubercle bacilli.

3.—Organisms too few in number or too low in virulence to infect the animals.

Regarding the first explanation we would say that scrupulous care was used to prevent contamination in all procedures. All glassware was mechanically and chemically cleaned with the utmost care; new microscopic slides were invariably used; distilled water was used for all reagents, and separate stains and decolorizing reagent were used for each slide.

Regarding incorrect identification, although of course quite possible, none were called positive

until at least several typical organisms were seen, and always in two different slides.

In favour of the last explanation, *i.e.*, insufficient infectious agent, we would submit that the amount of material inoculated (1 cc.) was smaller than ideal; the objection to larger amounts being the high early mortality from non-specific infections; it is also possible that with larger amounts of material inoculated, some of the negative concentrations would have given positive pigs. All of the four cases, showing apparent discrepancies had moderate but typical parenchymatous tuberculosis. Three of the four had been positive by the direct method at previous dates, *i.e.*, one, four months previously; one seven months previously, and one sixteen months previously. It seems therefore most probable that dearth of infectious material was the cause of the discrepancy, in at least the three previously positive cases. This technique in our hands has been useful in throwing light on a number of cases involving a difference of medical opinion, and in others has necessitated a revision of a previous non-tuberculous diagnosis. The history of several interesting cases in which the method was employed successfully was presented with the above description of the technique.

RADIOGRAPHIC FINDINGS DIAGNOSTIC OF PULMONARY TUBERCULOSIS*

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THIS paper represents an attempt to note some points, deductions, and conclusions arrived at after a reasonable survey of the literature and the interpretation of over ten thousand radiographic stereoscopic chest negatives of adults who have come under my observation, suspected of having some thoracic abnormality. The radiographic study was conducted by the writer in conjunction with a physical examination of the chest while associates correlated the evidence obtained from a general examination, laboratory findings, and an upper respiratory investigation. The final diagnosis was made only after a complete summarizing of the evidence and it is therefore apparent that such conclusions regarding the x-ray findings were arrived at "through the eyes of the internist."

What is the position of the radiographic evidence in diagnosis (chest)? The fundamentals of diagnosis are:

(1) A carefully taken history, (2) physical examination, including inspection, palpation, percussion, and auscultation, (3) laboratory methods.

Inspection is part of the physical examination and the radiographic study secures an "inspection of the inner thorax." It is, therefore, conclusive that such evidence is in reality a part of the method of inspection and therefore should be classed as an integral part of the physical examination. This we feel is the position of the x-ray in the diagnosis and study of thoracic affections. It seems unreasonable to compare radiographic findings with those found on the so-called physical examination. Each is a part of the same method.

What constitutes a normal stereoscopic appearance of the lungs and bronchi? An ideal normal is easily described and seldom found. There is a wide range between an ideal normal and the radiographic findings in the chest of the average healthy adult.

What radiographic findings are characteristic of pulmonary tuberculosis? (1) None are "pathognomonic", (2) A few may be considered as "reasonably characteristic", (3) Some should be termed suggestive.

The radiographic diagnosis of pulmonary tuberculosis in the adult should in most instances be limited to coalescing lesions. It is unwise to read peribronchial and root tuberculosis in chest films. Heavy trunk and root shadows result from many affections. We may speak of positive laboratory findings with a degree of certainty, but

*Read before D.S.C.R. Conference on Tuberculosis, Ottawa, Canada, April, 1924.

'p ositive x-ray findings" is a phrase used with more frequency than accuracy.

Can the question of ac'ivity be determined by the radiographic readings? Activity means absorption of tuberculo is toxins. The radiogram cannot determine if absorption is occurring. "Recent" and "remote" are safer terms to employ. Soft, flaky, woolly, smoke-like densities as a rule indicate recent inflammatory processes. Hard, irregular, clean-cut shadows represent lesions of greater age. Up to the present time there has not been sufficient evidence established to prove the fact that there are any radiographic signs by which the presence or absence of activity or the clinical course of pulmonary tuberculosis can be definitely determined. The question of activity is for the clinician to grapple with. In many instances, even after every available method is employed, months may be required to decide whether or not activity is present, and even then the writer finds it impossible to come to a definite conclusion in not a few instances.

What is a suitable geographic scheme to help us in the study of radiographic densities for signs suggestive of present or past tuberculosis? The National Tuberculosis Association of the United States has established a splendid plan which should go far in standardizing such x-ray evidence. This arrangement divides the lung field into (1) the lung root zone (inner vertical), (2) the bronchial zone (middle vertical), (3) and the lung field zone (or outer vertical). In this way a standard description is made possible. It should be remembered in the interpretation of these zones that they are curved in conformity with the body outline and are not flat planes.

Study of Root Shadows.—Is there any definite density in this zone which is representative of a tuberculous process? We think not. Other conditions may form densities simulating tuberculous adenopathy such as: (1) affections of the upper respiratory tract, (2) changes due to circulatory deficiency, (3) poor technique, (4) foreign body, and (5) peritoneal affections.

Do calcareous deposits mean past tuberculosis? No. Calcareous degeneration may come from any mechanical, chemical, or infectious irritant. Calcified nodules may form in a reasonably short time (twelve months). Some investigators have shown that calcified lung root glands may contain living B. tuberculosis.

Jarvis[1] in emphasizing the influence of enlarged tonsils and deflected septa on the lungs and bronchi found that workers with such affections failed to stand the constant inhalation of silicon dust and applicants for jobs in the granite mines were rejected if upper respiratory affections were present. Some observers think that enlarged lung root glands are a forerunner of pulmonary tuberculosis; that root glands reflect the degree of pulmonary drainage and that their size and appearance may be regarded as an index to extent and activity of the pulmonary lesion. On the other hand, Opie[2] (Phthisiogenesic and Latent Tuberculous Infection) states, "In apical tuberculosis of adults and of older children there is seldom an associated tuberculosis of the regional lymphatic nodes, and caseous tuberculosis of the glands characteristic of the focal infection of childhood is lacking in adults." This view is confirmed by Powell and Hartley[3]. According to this work it is evident that the initial tuberculous infection is through the upper respiratory tract and the primary lesion occurs in the lung field proper, and the lymphatics continue the spread of the disease if healing does not take place. The next seat of involvement is a bronchial gland which, if it ruptures into a pulmonary vessel, gives us an explanation for the distribution of an adult tuberculosis along the ramification of the terminal vessels in the upper lung. The root glands, however, usually remain small and seem to act as a relay station. It is then evident that this root zone cannot be considered as a true indicator of the amount, character, severity, or acuteness of the pulmonary disease.

Bray[4] thinks that enlarged lung root glands in a case of pulmonary tuberculosis do not warrant the assumption that such enlargement is invariably the result of tuberculosis and that in acute generalized miliary tuberculosis the glands may not be noticeably enlarged, which is strong evidence in favor of the root zone not reflecting the degree of toxic drainage from the lung.

Bronchial Tree Densities.—Usually characterized by a generalized increased visualization of the entire bronchial tree. The increase in the linear markings is evenly distributed. Localized bronchitis is a pathological entity and in such cases the thickened trunks and associated branches are alone involved. In general or local involvement the markings may reach the pleura in affections other than tuberculosis. It is a question if these radiations, even when irregular and nodular, have any connection with the bronchi, but rather represent a dilatation of the blood vessels and lymphatics. The pressure of bronchial nodes on the afferent vessels at

the root of the lung may account for these shadows.

A generalized thickening of the bronchial branches may be due to tuberculosis but it does not often take this form. Localized bronchial thickening in an apex may be due to other causes than tuberculosis, such as, nose and throat affections and dusty occupations. Increased markings in the bronchial tree leading into the upper third of the lung are seen in the x-ray findings of so many "symptomless adults" as to be worthy of "guarded consideration."

Heise and Sampson[5] state that the peribronchial type of tuberculosis has the following characteristics as compared with the parenchymatous type. (1) Less frequent occurrence of dry pleurisy and haemoptysis, (2) Coarse râles found in only 3% as compared with 57% in parenchymatous lesions, (3) Tubercle bacilli are found in only 7% of such cases, (4) Lessened skin sensitivity to tuberculin. These figures show that 93% of the peribronchial type of the affection was diagnosed as tuberculous in the absence of coarse râles, tubercle bacilli in sputum, or frank parenchymatous involvement as seen on the radiogram. Such cases, therefore, allowed a greater chance of error on account of more limited amount of positive evidence.

Lung Tissue Involvement.—What signs may be considered as "reasonably characteristic of tuberculosis?" A soft, cloudy, smoky, cotton-wool appearing density located in the outer upper lung field and communicating through a thickened bronchial branch with the lung root zone is the most definite radiographic sign of pulmonary tuberculosis, if pneumonia can be excluded. Even this sign may be considered with reservation.

Middle Zone and Basal Lesions.—Few are suggestive of tuberculosis. The findings of tubercle bacilli in the sputum or in an inoculated guinea pig is the only method of determining in the living subject that such densities are due to a tuberculous process.

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CONCLUSIONS FROM REPEATED PHYSICAL AND X-RAY EXAMINATION OF EX-SERVICE MEN*

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OUR experience covers a period of eight years, that is, from 1915 to the present. During this time 1344 men were admitted to the Nova Scotia Sanatorium; 508 were re-admitted, many of them several times; and in addition 1088 examinations were given to pensioners sent to us for report. This has given us an excellent opportunity to study respiratory diseases in ex-service men and to observe the course of the disease from repeated physical examination and serial x-ray plates over a period of years.

The standard of our examinations is pretty much the same as your own, and includes a careful history of the illness of the patient; a complete physical examination; nose, throat and dental examinations; laboratory examinations, including sputum analysis, complement fixation, and Wassermann tests; x-ray examinations; and finally the correlation of all the findings at our medical meetings so that diagnosis may be decided upon.

Twelve hundred unselected cases are included in this study, and some of the lessons we have learned will be briefly placed before you. I cannot say that anything entirely new has been discovered, and you have all probably reached the same conclusions as myself regarding examination findings in ex-service men.

The first lesson we have learned is regarding the diagnostic value of symptoms given in the history of these patients. The condition on admission of the 1200 was as follows:

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*Read at the Conference of Sanitarium Medical Superintendents, D.S.C.R., Ottawa, April 8th, 1924.

XUM

Not tuberculous.....332 or 27.7 per cent.
Suspected tuberculous..... 42 or 3.5 per cent.
Tuberculous.....826 or 68.8 per cent.

including minimal, moderately advanced, and far advanced. Of the 1200, 65 or 5.4% gave a negative history; 58 or 4.8% gave a doubtful history; 761 or 63.4% gave what we might call a positive or at least a suggestive history, that is, such symptoms as cough, expectoration, loss of strength, weight and appetite, chest pains, (the cardinal symptoms, hæmoptysis and pleurisy with effusion are not included amongst these). 238 or 19.9% gave a positive history including hæmoptysis; 78 or 6.5% gave a positive history including pleurisy with effusion; that is, 1077 or 90% of the entire group, tuberculous and non-tuberculous, gave what we would have considered in the past to be a positive history of tuberculosis but to which, today, in the light of our present knowledge, we do not give nearly the same value as we did years ago. To these symptoms I will refer in detail when I come to our re-admission study.

There are two symptoms to which I would specially call your attention, *viz*, hæmoptysis and pleurisy with effusion. In the 1200 cases, 238 patients gave a history of hæmoptysis and in 70% of these a parenchymatous x-ray lesion was found in the lungs. This is not in accord with the findings of Brown and Heise of Saranac Lake, who state that intra-pulmonary x-ray changes will be found in 90% of patients who give a history of hæmoptysis. I may say, however, if we exclude the non-tuberculous conditions in this group, and consider only the tuberculous, then our findings are the same as theirs. The difference in percentage may be attributed to the fact that ours is a study of ex-service men while theirs is a study of civilian patients.

Pleurisy with effusion is a most dependable symptom. Of the 1200, 78 gave a history of wet pleurisy, and in 78% of these, a parenchymatous lesion was found by the x-ray.

As for chest pains, they were given in the history of 90% of the whole group, tuberculous and non-tuberculous, and consequently are considered of no diagnostic value whatever.

The second lesson we have learned is regarding physical findings. In our series of cases, inspection of the chest has proved to be of more value than percussion, and ranges next in worth to auscultation. Percussion appears to be of little aid in detecting early tuberculous changes in the lungs. Alteration in the lung note, especially when heard in the upper third of one or both lungs, which we once considered of value in clinching a diagnosis, is no longer to be depended upon, as we find the same changes in note in respiratory diseases other than tuberculosis.

Auscultation continues to be our surest procedure in the physical examination of the chest. I have this to say regarding breath sounds. Feeble or diminished breathing, rough breathing, increased or exaggerated breathing, interrupted or cog-wheel breathing, cannot be depended upon in the absence of râles, to establish a diagnosis of tuberculous disease. Even moderate broncho-vesicular breathing in the upper third of the lungs, in the absence of râles, is not to be relied upon in more than 50% to 60% of cases, and unless the breathing is more of the bronchial type, it is of no great worth in clinching a diagnosis. The only sure auscultatory sign is râles, and when they are heard in the upper third of the chest, that is above the 2nd or 3rd rib and 4th vertebral spine, they are almost a sure indication that tuberculous disease is present. This is borne out from our x-ray studies. Two years ago, at one of our meetings, Dr. Stewart stated that no one should be pronounced tuberculous unless one or more of the following findings were present: Tubercle bacilli, a parenchymatous x-ray lesion above the 2nd or 3rd rib and 4th vertebral spine; fine or moderately coarse râles in the same locality; a history of hæmoptysis, or a history of wet pleurisy. The correctness of his statement is shown in the graphic chart, *Figure I*, which represents the fact that in our study, when tubercle bacilli are present, a parenchymatous x-ray lesion will be found in 93% of patients, (and if we include peribronchial conditions, in 97% of patients). When râles are found in the upper third of the lung, a parenchymatous x-ray lesion will be seen in 90% of patients. In those giving a history of wet pleurisy, a parenchymatous x-ray lesion will be found in 78% of patients. When there is a history of hæmoptysis, a parenchymatous x-ray lesion is found in 70% of patients.

The third lesson we have learned is regarding laboratory findings. We see the need of greater care in the microscopic examination of sputum. By care, in apparently negative cases, I mean not only the examination of specimens taken on several consecutive days, but also the spending of a much longer time in the study of each smear,—at least 5 to 15 minutes. I may say

that in dubious cases, the specimen examined must be one secured from the patient in the presence of the nurse. We use as a routine the direct method, and, whenever it is negative, the concentration method is tried. We find that in every case positive by the concentration method it is possible to discover tubercle bacilli by the direct method, provided a sufficient time is given

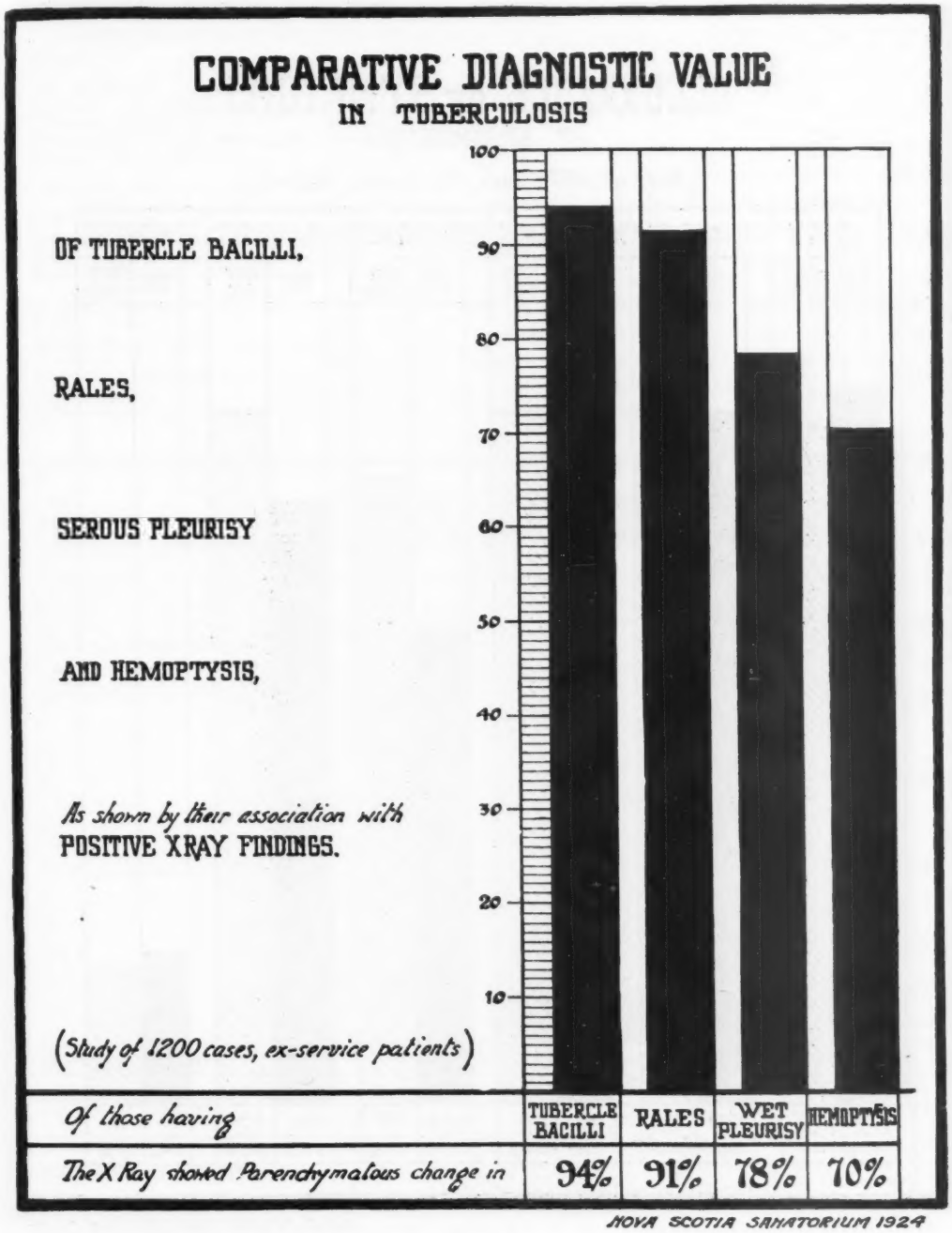

CHART I.

Conclusions from repeated physical and x-ray examinations of ex-service men.

for the search. It is advisable in all cases to give the Wassermann test. Out of 243 receiving this test, 13 or 5.3% gave a positive reaction. We have tried the complement fixation test with our patients, and agree with others that it is of little value.

Beside the larger group we have also made a special study of re-admission cases. As patients

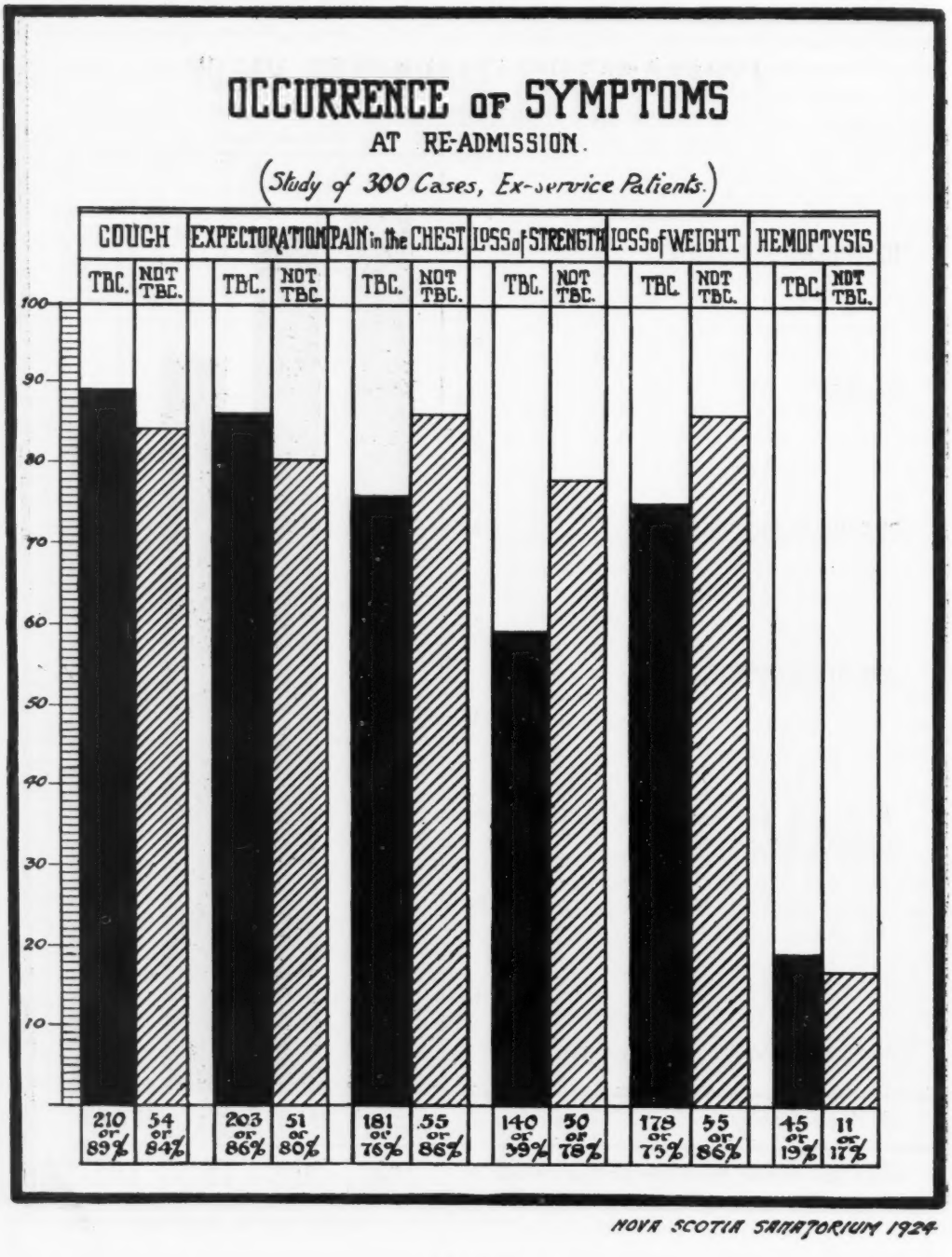

CHART II.

Conclusions from repeated physical and x-ray examinations of ex-service men.

continued coming back to the Sanatorium for treatment, we considered it worth our while to enquire into the causes producing relapse, and, during the past three years we have carried out a study of three hundred re-admission cases. The condition on first admission of the 300 was as follows:

Not tuberculous	45 or 15%
Suspected tuberculous	20 or 6.7%
Minimal tuberculous	84 or 28%
Moderately advanced tuberculous	115 or 38.3%
Far advanced tuberculous	36 or 12%

The condition on re-admission was as follows:

Not tuberculous	56 or 18.7%
Suspected tuberculous	4 or 1.3%
Minimal apparently cured	54 or 18%
Minimal arrested or apparently arrested	14 or 4.7%
Minimal quiescent	5 or 1.7%
Minimal active	8 or 2.7%
Moderately advanced, apparently cured	25 or 8.3%
Moderately advanced, arrested or apparently cured	12 or 4.0%
Moderately advanced quiescent	22 or 7.3%
Moderately advanced active	36 or 12%
Far advanced quiescent	9 or 3%
Far advanced active	55 or 18.3%

The symptoms given by the tuberculous and not tuberculous are compared in the graphic chart shown in *Figure II.*

A history of cough was given in 84% of the not tuberculous against 88.9% of the tuberculous; expectoration in 80% of the not tuberculous against 86% of the tuberculous; chest pains in 86% of the not tuberculous against 76% of the tuberculous; loss of weight in 86% of the not tuberculous against 75% of the tuberculous; loss of strength in 78% of the not tuberculous against 59% of the tuberculous; hæmoptysis in 17% of the not tuberculous against 19% of the tuberculous. This shows clearly the unreliability of the ordinary symptoms in the diagnosis of tuberculosis, in this type of case. I would like to say this regarding hæmoptysis, that in the absence of râles and a parenchymatous x-ray lesion in the

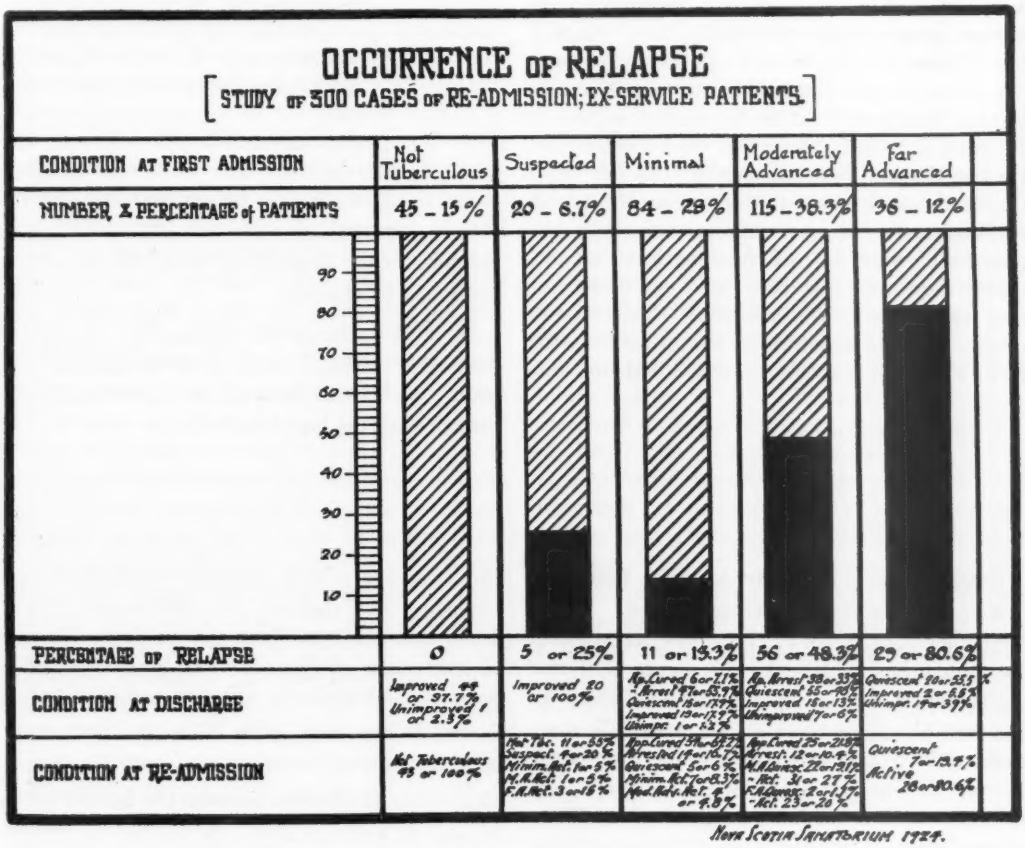
OCCURRENCE OF RELAPSE
[STUDY OF 300 CASES OF RE-ADMISSION; EX-SERVICE PATIENTS.]
CONDITION AT FIRST ADMISSION
Not Tuberculous
Suspected
Minimal
Moderately Advanced
Far Advanced
NUMBER & PERCENTAGE of PATIENTS
45 - 15%
20 - 6.7%
84 - 28%
115 - 38.3%
36 - 12%
90
80
70
60
50
40
30
20
10
PERCENTAGE OF RELAPSE
0
5 or 25%
11 or 13.3%
56 or 48.3%
29 or 80.6%
CONDITION AT DISCHARGE
Improved 44 or 97.7% Unimproved 1 or 2.3%
Improved 20 or 100%
App. Cured 6 or 7.1% - Arrest 9 or 10.7% Quiescent 15 or 17.7% Improved 13 or 15.2% Unimpr. 1 or 1.2%
No. Arrest 38 or 33% Quiescent 55 or 48% Improved 15 or 13% Unimproved 7 or 6%
Quiescent 20 or 55.5 % Improved 2 or 5.5 % Unimpr. 14 or 39%
CONDITION AT RE-ADMISSION
Not Tuberculous 93 or 100%
Not Tbc. 11 or 55% Suspect. 4 or 20 % Minim. Act. 1 or 5% M.A. Act. 1 or 5 % F.A. Act. 3 or 15 %
App. Cured 5 or 5.7% Arrested 14 or 16.7% Quiescent 5 or 6 % Minim. Act. 7 or 8.3% Mod. Adv. Act. 8 or 9.5%
App. Cured 25 or 21.8% Arrest. 12 or 10.4 % M.A. Quies. 22 or 19.1% - Act. 3 or 2.7 % F.A. Quiesc. 2 or 1.7% - Act. 23 or 20 %
Quiescent 7 or 13.9 % Active 28 or 80.6%
Nova Scotia Sanatorium 1924.

CHART III.

Conclusions from repeated physical and x-ray examinations of ex-service men.

lungs, one should hesitate to consider the bleeding as of tuberculous origin.

The graphic chart shown in *Figure III* gives you a comparison of the different conditions or stages of the disease with regard to the *occurrence of relapse*. Possibly "relapse" is not the best word to use, but we could think of none better, and we have placed under "relapse" all patients who showed extension or activity of their disease on re-admission.

You will note that none of the non-tuberculous relapsed. Of the suspected, 25% relapsed; of the minimal, 13.3% relapsed. The lesson to be learned here, it seems to me, is that the majority of the dry lesion cases in* this group should be at work at the end of the first year, provided suitable employment can be secured for them, and by the end of the second year after they have been pronounced "apparently cured" they should be earning a full living. Consequently, we do not see that it is necessary for pension to be continued to them indefinitely. In the moderately advanced group you see that 48.3% have relapsed The lesson to be learned here, as far as pension is concerned, is that reduction in pension for men in this class should not be too abrupt, especially in cases in which there has been evidence of clinical disease. For this group the one most urgent demand is for the provision of suitable employment. No one can say precisely the amount of work any of these patients can do, unless they have first been tried out under our own supervision. The best place to do this, of course, is at the sanatorium, but so far no satisfactory system has been worked out for this purpose. It is a significant fact that from the history of these re-admission cases we have learned that one of the chief causes of relapse has been unsuitable employment. It is evident that vocational re-training has not been of great practical service in re-establishing the tuberculous ex-service men, largely because suitable employment has not been secured for them. I feel while Dr. Arnold and Dr. Carmichael are in office, both of whom understand especially well and have at heart the needs of the ex-service man, now is the time to work out this problem. Something is urgently needed for these patients in Nova Scotia, as I have no doubt it is in other provinces in Canada, and I am convinced that the Department will not have done the best thing possible for the recovered and partly recovered consumptive until it has assisted them in procuring suitable employment. An essential to any successful after-employment scheme would be the services of an industrial expert, or adviser, or possibly committee, who would look into the individual case with the medical adviser and see that suitable employment is secured for the patient, or a market for his product if he is employed at home.

As for the far advanced, you will see that 80.6% have relapsed. The work problem here is not so urgent, for the reason that few of them can be expected to earn their own living, and pension, for the majority of them, will have to be continued indefinitely.

(Following this paper, x-ray films in several cases illustrating the lack of agreement between history and x-ray findings were shown, in connection with the case reports.)

*The Minimal Group.

Contagiousness of Acute Anterior Poliomyelitis. — E. Schwarz (*Schweiz. med. Woch.*, December 27th, 1923, p. 1202) has investigated the numerous outbreaks of acute anterior poliomyelitis during 1923 in Switzerland. In the first three quarters of the year 123 cases were notified, and in October alone there were 70 new cases. In epidemics in America, no sources of infection have been found in 75 to 90 per cent. of all the cases, but in at least half the Swiss cases the source, or probable source, of infection could be ascertained. In those cases in which there was a single known exposure to infection the incubation period seemed to be from three to ten days. It was characteristic of this outbreak that school children and adults were affected rather than infants; in one area, with 90 cases, there were only 33 children under the age of 5, whereas there were 33 children between the ages of 6 and 16, and 22 patients above the age of 17. There was also a comparatively high proportion of atypical cases.—*Brit. Med. Jour.*, Feb. 23, 1924.

SYMPTOMS OF UPPER RESPIRATORY TRACT DISEASE SIMULATING TUBERCULOSIS*

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DISEASE of the upper respiratory tract may produce a group of symptoms simulating to a marked degree pulmonary tuberculosis, *i.e.*, cough, sputum, headaches, fatigue on rising in the morning, disturbances of digestion, and slight afternoon elevation of temperature.

Nasal disease.—A cough may originate in any part of the upper or lower respiratory tract. In the upper respiratory tract we may have cough resulting indirectly from a blocking of the nasal passages. Improper ventilation of the nose and its accessory sinuses due to a marked deviation or irregularity of the nasal septum leads in many cases to passive congestion with hypertrophy and polypoid degeneration of the mucous membrane of the turbinates. This may be followed by partial or complete blocking of the ostium of one or more of the accessory sinuses. Interference with the proper drainage of the latter usually results in chronic infection with the formation of muco-purulent secretion. The sinus gradually fills and overflows into the naso-pharynx and pharynx. A paroxysm of coughing may result and continue until the mass of partially dried and tenacious secretion is removed. During sleep the secretion may find its way into the larynx and the upper portion of the trachea and on awakening in the morning the patient is seized with coughing and more or less so-called sputum is raised. Difficulty in breathing through the nose also not infrequently interferes to such an extent with sleep that the patient arises in the morning feeling tired and listless. The continual swallowing of muco-purulent secretion from the accessory sinuses of the nose may also lead to disturbances of digestion. The acute exacerbation of a chronic maxillary or frontal sinusitis often gives rise to vertical or frontal headaches associated with a slight elevation of temperature.

Hæmorrhage from the throat does not always originate in the lung; in fact the spitting of blood is perhaps more frequently the result of a small bleeding area in the upper rather then the lower respiratory tract. Dilated venules on the anterior portion of the nasal septum is a very common site. These may rupture and if the patient is in a recumbent posture the blood trickles back and fills the throat. Dilated blood vessels at the base of the tongue or on the lower portion of the posterior wall of the pharynx may also be a source of bleeding. Freudenthal reports a case of severe hæmorrhage from a bleeding area in the trachea but the writer has never seen a hæmorrhage from the larynx or trachea except in cases of malignant disease in this area.

Methods of examination.—A careful rhinological examination will enable us to determine the condition of the mucous membrane and the presence or absence of purulent secretion within the nose. The presence of pus in the middle meatus or on the floor of the nostril directs attention to investigation of the maxillary antrum, the frontal sinus, and the anterior ethmoid cells. Pus in the superior fossa or in the vault of the pharynx may come from the posterior ethmoid or sphenoidal sinus. The transillumination of the accessory sinuses of the nose is in my experience of very little diagnostic value. Stereoscopic radiograms of the head will give us information regarding the size and position of the accessory sinuses but the attempt to diagnose disease of the accessory sinuses by this means alone leads to grave errors in many cases. The x-ray may show a dense opaque antrum or frontal sinus which on being opened is found to contain no pus and to be lined by normal mucosa. On the other hand, the nose may be filled with masses of polypi bathed in pus coming from the ethmoid cells and the radiogram give a clear picture of this area. In maxillary sinus infection exploratory needle puncture followed by lavage is the only method of accurate diagnosis and should be used on all cases in which one suspects involvement of this sinus.

Pharyngeal conditions.—Catarrhal pharyngitis

*Read at Tuberculosis Conference, Ottawa, April 8th, 1924.

with injection and hypertrophy of the lymphoid tissue on the posterior wall associated with focal infection in the tonsils is a most frequent source of cough and sputum. The diagnosis of focal infection in the tonsils is not always as simple as some would have us believe. In adults the large soft hypertrophied tonsil is less often the site of disease than the small fibrous buried adherent one. Casual examination of the pharynx in the latter cases may show little evidence of infection. On closer inspection one may find the tonsil adherent to both anterior and posterior pillars and the crypts filled with cheesy caseous material. By making firm pressure on the anterior pillar with a blunt instrument one may find the tonsil contains a considerable quantity of thick yellow pus which on bacteriological examination is found to contain streptococcus viridans or hæmolyticus. Some enlargment of the lymph nodes at the angle of the jaw is usually present.

An elongated uvula may interfere sufficiently with respiration particularly at night when the patient is in a recumbent position that spasms of coughing associated with slight dyspnoea result.

Excessive cigarette smoking producing a hyperirritability of the pharyngeal and laryngeal mucous membrane is also not infrequently the cause of persistent dry hacking cough. During the war more than one man was evacuated from the front line with a tentative diagnosis of pulmonary tuberculosis whose symptoms cleared up entirely when his cigarette ration was cut off.

Laryngeal conditions.—Laryngitis sicca and pachyderma laryngis are conditions of the larynx which may give rise to symptoms simulating tuberculosis. Hoarseness, persistent cough, and masses of muco-purulent secretion which are very difficult to dislodge, are characteristic of these diseases. Lupus of the larynx also produces symptoms which may be mistaken for tuberculosis but the presence of marked fibrosis, warty growths with very little ulceration of the larynx are diagnostic features. Lupus of the larynx is also usually secondary to lupus of the skin. Two cases which came under the writer's observation during the past few years show how non-tuberculous lesions of the larynx may produce symptoms leading to a diagnosis of tuberculosis.

Case 1.—E. J. Male. Aet 32. Complaint—dry hacking cough off and on for six months associated with moderate amount of sputum. During the past two months patient has lost considerable sleep and about 10 lbs. in weight. Although no definite tuberculous focus could be found on examination of the chest radiograms showed the presence of marked peribronchial thickening and the diagnosis of incipient pulmonary tuberculosis was made. Patient was advised to go to a sanatorium for treatment. Before leaving the city he was referred to me for laryngological examination. The latter showed the presence of a small papilloma attached to the anterior portion of the right vocal cord. After removal by means of a laryngeal forceps the patient was given a laryngeal spray and placed on vocal rest for two weeks. At the end of this period his symptoms had completely cleared up and he has since shown no evidence of tuberculosis.

Case 2.—M. L. R., male, Aet 28. Complaint—persistent hoarseness and some difficulty in swallowing beginning in 1916. His condition was diagnosed in 1917 as tuberculous laryngitis and he was admitted to a sanatorium for treatment. He remained there for 18 months during which time he put on a few pounds in weight. His laryngeal condition grew progressively worse and he returned home. He was referred to me for examination in 1920. His general physical condition was good. The larynx was found to be almost completely filled with an ulcerative mass of granulations which had a moth-eaten appearance. This was not typical of either tuberculosis, syphilis, or malignant disease, and the fact that careful and repeated examinations of the chest assisted by radiograms revealed no evidence of a tuberculous lesion in the lung pointed very strongly to a non-tuberculous involvement. Wassermann tests of blood and cerebro-spinal fluid were negative and accordingly portions of the diseased tissue were removed by direct bronchoscopy for pathological examination. The final pathological report given by Drs. McWhorter and Ewing of N.Y., was a basal cell epithelioma of the larynx. Total laryngectomy was necessary to save the patient's life.

These cases illustrated the advisability of a thorough examination of the upper respiratory tract in all cases giving symptoms suggestive of tuberculosis.

OBSERVATIONS ON SOME OF THE COMMONER SEPTIC CONDITIONS OF THE CHEST

Their Diagnosis and Treatment*

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AMONG the many cases coming under the observation of the chest specialist are some who have persistent cough, purulent expectoration, debility, periods of pyrexia, loss of weight and strength to a varying degree yet they are non-tuberculous, but the diagnosis and much of the treatment of such cases falls to the lot of the sanatorium man. Whether they are cases of chronic bronchitis, septic pulmonitis, bronchiectasis, abscess, chronic empyaema, or other disease, it is his task to determine and to advise the appropriate treatment.

A careful history is the first step towards an accurate diagnosis. Symptoms dating back many years, perhaps to childhood, with copious purulent expectoration over a long time and comparatively slight constitutional symptoms suggest the probability of bronchiectasis. The history of an acute respiratory infection with imperfect recovery and persistent purulent expectoration, may mean abscess of the lung or empyema with bronchial fistula. Symptoms having their onset after an operation, especially one for removal of tonsils or extraction of teeth, probably mean abscess of the lung; and, in case of teeth extraction, perhaps a portion or a whole tooth lodged in a bronchus. A mother's story of a choking, coughing spell in her child while the little one was playing about on the floor may mean a foreign body in the bronchial tree. A history of numerous negative sputum examinations in the presence of free purulent expectoration over considerable time should always arouse suspicion of a non-tuberculous lesion.

The full and careful history should be followed by a complete physical examination of the whole body with especial reference to possible foci of infection; teeth, tonsils, nose, and accessory sinuses, that is the whole upper respiratory tract generally needs a very careful overhauling. Focal infection of the upper respiratory tract undoubtedly is responsible for many of the cases of persistent chronic bronchitis. While the relation between septic basal lesions and foci of infection in the upper respiratory tract is fairly well recognized, the influence of septic foci in other parts of the body is not so evident but the influence of the focal lesion on general health is sufficient reason for its removal.

The physical and radiographic signs are usually basal but, as has been recently pointed out by Pritchard of Battle Creek, they may be apical, especially in those cases with abnormalities of an obstructive type in the nose and throat, and thus simulate an early tuberculosis rather closely. The absence of bacilli in the sputum and the clearing up following treatment of the nose and throat separates them from pulmonary tuberculosis.

Physical signs do not help much in differentiating the different types of basal sepsis. If, with lower lobe signs, there is free expectoration, foetid in character, sometimes blood stained, associated with shortness of breath, comparative freedom from constitutional symptoms, clubbing of the fingers, and a rather negative looking radiograph you are fairly safe in making a diagnosis of bronchiectasis. Dulness with loss of tactile fremitus suggests fluid and should call for the use of the exploring needle.

The x-ray is of very definite value in the differential diagnosis of septic chest conditions. While some cases of bronchiectasis may show very little, and that little not definitely diagnostic, abscess or empyema usually show a fairly gross picture. Unsuspected old tuberculosis may be revealed and fluid levels shewn up in abscess or empyema cavities. Beware of the radiographic diagnosis of thickened pleura. It usually means fluid, frequently empyema.

Accurate localization of the septic focus within the lungs probably can best be made by means of the bronchoscope. Unfortunately bronchoscopy, except in the most skilled hands, is a very disagreeable proceeding for the patient. Skilled

*Read at the Conference of Sanitarium Superintendents, D.A.S.R., Ottawa, April 1924.

bronchoscopists are all too few in this country but I think the diagnosis and treatment of septic conditions of the chest cannot be carried out to the best advantage without their aid.

The injection of bismuth into the suppurating area either by way of the trachea through the bronchoscope or by means of a needle inserted through the chest wall often gives a surprising picture of the cavitation present but previously unsuspected.

Having completed our examination including the blood, urine, sputum, and Wassermann test, we are ready to consider the means available for treating the septic pulmonary conditions. These may be considered as local and general measures.

Sanatorium routine which aims to build up general resistance and the elimination of focal infections sums up about what we can do in a general way. Drug therapy is of little use.

The treatment directed to the thorax itself is of three main types: Direct drainage through the bronchial tree aided by posture and bronchoscopic aspiration and direct drainage through the thoracic wall; Indirect drainage by compression, brought about by belts, plaster casts, pneumothorax, phrenicotomy, or thoracoplasty; and last on the list, and, at present, least used, excision of the diseased focus.

General treatment may be applied to all types of lung suppuration but what the local treatment should be becomes a real problem. It is usually wise to try out first the simplest method that offers any prospect of being effective.

Posture is the simplest and safest means of mechanically aiding drainage from the bronchial tree. Much trying out may have to be done and much patience used in order to find the position which aids drainage. If the inverted position is found to be the best, do not discourage your patient by allowing him to maintain that position too long at first. Two or three minutes is quite enough. The time should be gradually lengthened.

Postural treatment has many uses. For the secondary infection and cavitation associated with pulmonary tuberculosis this treatment systematically used has been found to lessen toxaemia and improve the general condition to a remarkable degree. Probably we do not make as much use of it as we should. The septic infection in some of our tuberculous cases is the major disability. For lung abscess opening into the bronchial tree it may always be tried. It will do harm in none and may be all that is necessary to cure in others. In bronchiectasis also it is of some value.

General treatment, as has been said, may be applied to all types of septic chests and postural treatment may be said to be local treatment of general application; but it must be remembered that while general treatment may be all we can do in some cases, we must not content ourselves with general treatment while the opportune time for the application of other measures is passing; and so, in lung abscess of the acute variety, it is wise to get busy as early as possible with treatment other than general and postural, and the next step in these cases is to do pneumothorax. If you see the case early enough do not wait for adhesions to form. If you do, you are missing the best opportunity to produce an efficient compression. If pneumothorax can not be obtained, you have done nothing to prevent drainage being tried later. There is danger of pyopneumothorax in all cases of abscess peripherally situated but there is possibly less danger of this complication when pneumothorax is produced early than later on when adhesions have become firmer and their separation is more likely to injure the lung. Pneumothorax should be tried early in all cases of acute lung abscess and kept up for two or three months after the disappearance of all symptoms. Where collapse is incomplete pneumothorax is apt to fail for it is likely to be the diseased portion that fails to collapse and it is in these cases that drainage by way of the bronchial tree may be interfered with, the neck of the bottle being closed off as it were. But even in this event, though the abscess be not cured, something is gained. You have found where the lung and chest wall are firmly adherent, and consequently the safe route to approach the abscess is indicated. Pneumothorax should be tried in chronic lung abscess but the chances of success are much less because there is less likelihood of there being a free pleural cavity and because of the greater induration of the diseased portion of the lung. This latter factor we are not disposed to consider very seriously. It is more than likely that the induration and fibrosis, provided there is free exit by way of the bronchial tree for the pus, is a beneficent force aiding the approximation of the abscess walls and thus favouring healing.

In unilateral bronchiectasis pneumothorax has a place though here again the prospect of finding a free pleural cavity is smaller and there

is the same danger of shutting off drainage, but no one knows the state of the pleural cavity till he has tried out pneumothorax and you will succeed in many cases where you had thought to fail. A compression of a bronchiectatic area produces an amelioration of symptoms. With that we may have to be content. Where a good pneumothorax is obtained, how long should it be maintained? It is difficult to set a time but we feel sure it must be a long time. In bilateral bronchiectasis pneumothorax on the worse side or on the side where compression can be obtained is worth a trial. We are not hopeful that pneumothorax will cure many cases of bronchiectasis except possibly the earliest.

With the use of the bronchoscope I am not at all familiar but one can readily see that its field of usefulness in some of the septic conditions may be great. In ascertaining the location and extent of a bronchiectasis it is our best guide. Where sepsis has resulted from the obstructing influence of a foreign body, its removal by the bronchoscope is usually enough to effect a cure.

Direct drainage by means of a tube is not so generally useful as one might, on first thoughts, be inclined to think and should not be too hastily tried. For the chronic empyema with bronchial fistula it is the method of choice. The drainage to be efficient must be dependent and free. Air-tight drainage has little special merit in these cases. Irrigation with Dakin's solution is a very valuable addition to the drainage and hastens materially the healing process. The presence of a bronchial fistula does not always prevent the irrigation from being carried out. If spasms of coughing are provoked it had better be discontinued.

For non-tuberculous lung abscess, uni-locular in type, either acute or chronic, where pneumothorax and posture can not be successfully applied, drainage by tube should be used. The trial of pneumothorax will usually have demonstrated the presence of adhesions and their location. Careful fluoroscopy combined with stereoscopic and lateral plates will have shown the most suitable route along which to approach the abscess and usually a one-stage operation can be done for drainage. Once the drainage tube has been safely put into the abscess cavity it should be clamped off and only opened periodically to drain the cavity. This precaution is very necessary for the first few days. The patient must retain his ability to cough effectively in order to clear out the blood and septic material that has been disseminated during the operative manipulation and trauma.

Direct drainage of a lobe in case of bronchiectasis is a very unsatisfactory procedure and it is doubtful whether it is worth the doing. In some cases of what are termed bronchiectatic abscesses prolonged drainage by means of a pulmonary fistula may result in improvement of the odour of the expectoration and in lessening its amount. This is the pulmonary lip fistula method advocated by Meyer of New York.

When confronted with a tuberculous empyema do not drain except for complications. Aspiration and irrigation are the means to be used when it is advisable to get rid of the pus. Secondary infection complicates the problem but even then aspiration and irrigation may be the method of choice. If there is reason to believe that there is little toxaemia from the secondary infection then aspiration and irrigation should be carried out but if there is much toxaemia and this is not appreciably lessened by the aspiration and it appears to be due to the secondary infection in the empyema, then it may be necessary to drain and to irrigate. Where the tuberculous empyema is complicated by a bronchial fistula it is more difficult still to decide what to do. Aspiration and irrigation are usually without appreciable results. Open drainage, while it relieves the distressing cough, yet very often it brings about no improvement in the general condition and very rarely cures them. The usual result is a steady progress downwards. Where the empyema occurs in the course of a therapeutic pneumothorax and is complicated by a bronchial fistula, drainage by tube is only a palliation and in these cases and in the preceding class there is more hope in a carefully done thoracoplastic operation which aims to obliterate the empyema cavity and at the same time to maintain the lung compression.

For such cases as can not be effectively dealt with by posture, pneumothorax, aspiration or drainage, or a combination of these, we may have to use surgical procedures such as thoracoplasty or excision. The tuberculous empyema with bronchial fistula, where the patient's general condition will permit major surgery, may very well be treated by thoracoplasty. The old chronic empyema whose cavity, even after proper drainage has been given a fair trial, fails to close, may reasonably be subjected to the same kind of treatment. Multiple abscesses of the lung, not yielding to other modes of treatment, may be

given the chance to heal by fibrosis if we remove a sufficient portion of the non-yielding thoracic wall. Fibrosis and its subsequent scar tissue contraction is one of Nature's means of clearing up a septic focus. The bounding walls of the pleural cavity are all capable of very considerable movement in response to the contractility of scar tissue within. The lobes of the lung too, are able to expand to allow some other lobe to contract. A diseased upper lobe may contract with resulting elevation of the hilus, the lower lobes expanding to fill the space. The upper lobe may fold up like a fan till it lies alongside the mediastinum a narrow solid band, the volume being made good by the remaining lobes. Areas of fibrosis within the lobes contract and the volume is made good by emphysema of the remainder. The diaphragm can be drawn up very considerably to assist in the closing up of a diseased area near the base but the diaphragm is a powerful muscle and resists being pulled upwards; so in some cases a phrenicotomy by producing a unilateral paralysis of the diaphragm may allow further contraction of the diseased area. The mediastinum is capable of much displacement in response to the pull of the contracting scar tissue, so much so, that the heart and the whole mediastinum may be drawn over into the right pleural cavity in right-sided fibrotic disease. We can not assist surgically in the movement of the mediastinum. We can do a little in the case of the diaphragm. The ribs are the most resisting of the thoracic boundaries and yet they are capable of being drawn in and down to a very considerable extent in response to Nature's pull. Fortunately too we are able to do much in removing the opposing force of the ribs by resecting portions of them, thus allowing the scar tissue to approximate the walls of cavities and produce their obliteration. Unilateral diffuse bronchiectasis, in certain cases, may be helped and even cured by a many-stage thoracoplasty after the method described by Hedblom in a recent article. His results would indicate that thoracoplasty is a much safer procedure for the cure of bronchiectasis than lobectomy.

Theoretically there are a number of septic and other conditions of the lungs that would be very satisfactorily settled by an excision of the part affected. The thoracic cavity can now be fairly freely opened for exploration. One or two lobes or more can be dispensed with and yet sufficient remain for the purposes of respiration. The removal is technically quite possible. It can be done with ease experimentally. But when we come to consider the septic lesions for which we would wish to do lobectomy we see that they are intensely septic and it is the septic complications that frequently provide the mortality in the procedure. As soon as a technique can be devised which will rid the operation of the dread of septic infection of the mediastinum and the pleural cavity and also a satisfactory method of permanently closing the bronchial stumps, then we may expect some brilliant results in the case of localized chronic septic lesions of the lungs.

Lobectomy has been done for bronchiectasis confined to one or two lobes and for mulitple chronic abscesses confined to one lobe, but, so far, the mortality has been very high, roughly about fifty per cent. The present endeavour of thoracic surgeons is to devise a technique for excision of the lung that will lessen the danger of empyema, septic mediastinitis, and tension pneumothorax. Progress is being made. Lilienthal proceeded to remove the lobe, close the chest except for an airtight drain much as one would remove a gangrenous appendix from the abdomen. About fifty-two per cent. of his cases died.

Dr. E. A. Graham of St. Louis has devised another method of getting rid of the diseased lobe and yet avoiding the septic and mechanical complications. He makes a large window over the lobe affected and, in several stages, with the aid of a soldering iron, he gradually burns away the diseased tissue.

Garre excised a lower lobe for bronchiectasis by first resecting a sufficient number of ribs to cause a caving-in of the chest wall sufficient to permit the delivering of the lobe and extra-thoracic treatment of the stump at a later date.

Recently Dr. Archibald of Montreal has reported a very successful case where he removed the lobe of one lung from a girl for bronchiectasis. He avoided the septic complications in the pleural cavity and any danger of tension pneumothorax by bringing the stump of the resected lung out of the pleural cavity into the chest wall. In order to do this it was necessary to do a preliminary thoracoplasty to allow chest wall and lung root to be approximated.

Therefore we have reason to hope that in the course of the next few years a satisfactory means of doing lobectomy will be found and a life of comfort and usefulness be given to many of these unfortunate sufferers.

THE DIFFERENTIATION AND TREATMENT OF LUNG ABSCESS BY EXPLORATORY PULMONARY PUNCTURE AND BISMUTH INJECTION*

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THE precision in diagnosis attained by the use of the x-ray, the bronchoscope, artificial lung collapse by pneumothorax, and also the improvement in treatment synchronous with aseptic surgery, have in recent years greatly stimulated interest in suppurative lung conditions.

A study of 3250 patients referred to the Saskatchewan Sanatorium for diagnosis or treatment resulted in the discovery of pulmonary abscess in 32, or 1%. In four of these cases the condition had a duration of less than three months and could be classified as acute; 28 were chronic, with an average duration of over four years.

In an endeavour to alleviate the condition by methods available, four forms of treatment were followed in this sanatorium:

1.—Rest and postural drainage gave excellent results in the four acute cases, but little in chronic cases so treated.

2.—Autogenous vaccine therapy gave no results in nine cases of chronic abscess.

3.—Lung collapse by artificial pneumothorax was produced in six very chronic cases, with a satisfactory result in one case only.

4.—Exploratory pulmonary puncture and bismuth injection was the method chosen in ten cases.

This latter method I will describe in detail, since it can be applied where the technically more difficult bronchoscopic method, with lavage and injection, is not available.

Exploration of the lung field by the needle for confirmation of the diagnosis of a suppurative focus is as old as thoracic surgery itself, but has always been condemned as a dangerous procedure. Yet the number of skilled bronchoscopists, Lynah[1], Jackson[2], Moore[3] who have described the more conservative method of exploration, are so few as to make needling a necessary procedure at least in more remote districts where skilled bronchoscopy is not available.

The curative value of bismuth injection in empyema or abscess with thoracic fistula was established by Emil G. Beck[4] of Chicago as far back as 1907. It was the dramatic recovery of an abscess with thoracic fistula, injected with Beck's paste, later to be described as Case 1, which led to the application of the injection treatment, in cases with bronchial fistula only, in the Saskatchewan Sanatorium.

The technique used for exploratory puncture and injection is as follows: The localized infiltrated area must be accurately related to such landmarks as the periphery of the lung, the mediastinum and the ribs by physical examination, fluoroscopy and radiographs, making use also of oblique and transverse plates if the exploratory puncture is to be successful in difficult cases. When the infiltrated area is in the lower half of the chest, a single plate is taken with proper orientation of the patient, focusing the tube over the affected area, and making the exposure in the resting period between breaths. If plates are taken on deep inspiration, the relation of the infiltrated area and the diaphragm to the ribs is so altered when at ease as to make the plates useless as a guide to exploratory puncture.

To emphasize indefinite findings, the use of heroin for 24 to 48 hours prior to exploratory puncture is helpful. This assures accumulation of secretions in the affected area, and thus emphasizes findings.

For anaesthetic purposes one-quarter grain of morphia 40 minutes before operation, combined with the local administration of one per cent. anocaine makes the operation quite tolerable.

The choice of the patient's position for operation will be determined by his condition, but it is essential that the position during exploration should be the same as that maintained while

*Read at the D.S.C.R. Conference of Sanitarium Superintendents, Ottawa, April 1924.

landmarks were being determined. If physical examination, fluoroscopy and radiographs have been made with the patient in the upright position, then best results can be attained by having him in the upright position during exploratory puncture. Ambulant patients are seated on a bench in approximately the same position as that in which all previous examinations have been made. This maintains the relations of the landmarks, gives easy access to all parts of the chest, and gives the operator a good sense of direction.

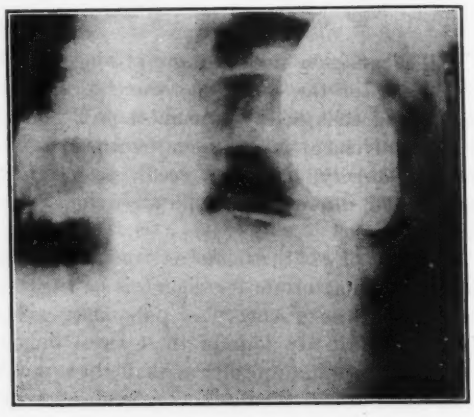
The selection of the needle we consider very important. The smaller the needle, the less chance there is of infective material being disseminated. The smallest needle through which pus can be withdrawn is the best. Beck's paste, when heated, and propelled by a *small*-barrelled syringe, can be easily injected through a comparatively small needle. We use No. 18 platinum, six inches long.

Assurance that the needle has entered the cavity is essential before injection. There is a sensation of resistance when passing through the wall of the chronic abscess, but the only assurance that the abscess has been entered is the withdrawal of pus. The pus having been found a specimen is drawn off, then the syringe is gently removed from the needle and loaded with Beck's paste heated to a temperature just above body heat. The syringe is slowly emptied. By so doing, pus will be displaced by bismuth, and the patient will cough up first pus, later some bismuth. The evidence of bismuth in the sputum is the necessary signal to proceed. Without signs of bismuth in the sputum, not more than 5 to 10 c.c. should ever be injected; but, with this favourable sign, injection can proceed slowly until pure bismuth is being expectorated. It may be then inferred that the cavity is filled. During the spasms of coughing, the syringe is removed so as to allow the needle to swing freely. Spasms of coughing can usually be controlled by suggestion.

Case Reports.—In all the cases to be described the condition was very chronic. The sputum in all contained mixed infection and was negative for tubercle bacilli. Wassermann tests in all cases were negative. Previous illnesses, where not mentioned, were irrelevant.

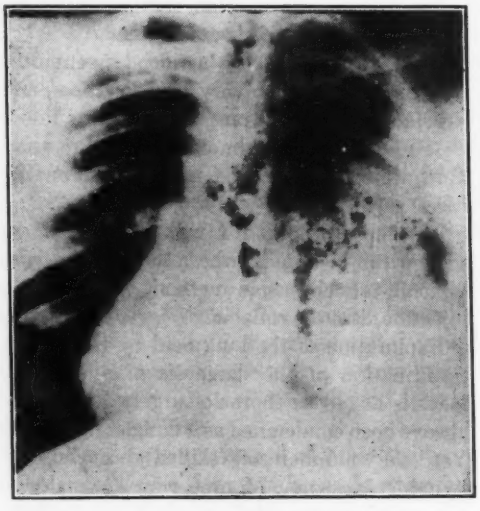
Case 1.—Soldier, aged 25. The present illness began with empyaema on right side. On Jan. 21, 1919, had rib resection. He did not regain health, so on June 27, 1919 he was sent to the sanatorium as a tuberculosis suspect. On admission he had severe cough, one-half ounce of sputum, temperature 102°, pulse 118, weight 20 lbs. below normal. Physical examination showed dullness over the entire right lung, increasing toward the base, with diminished breath sounds, and crepitations in lower third. The chest wound was discharging.

Treatment.—On July 7th, more rib was resected, and an abscess ruptured from which one pint of pus was evacuated. Symptoms improved temporarily, but the discharge persisted. On Sept. 5, a catheter was introduced and the cavity injected with Beck's paste. X-ray plate Fig. 1, showed a bismuth filled area the size of a turkey egg in the posterior part of the base of the right lung. The discharge ceased and the wound healed in ten days. Symptoms disappeared and the general condition improved.



CASE I.—FIG. I.

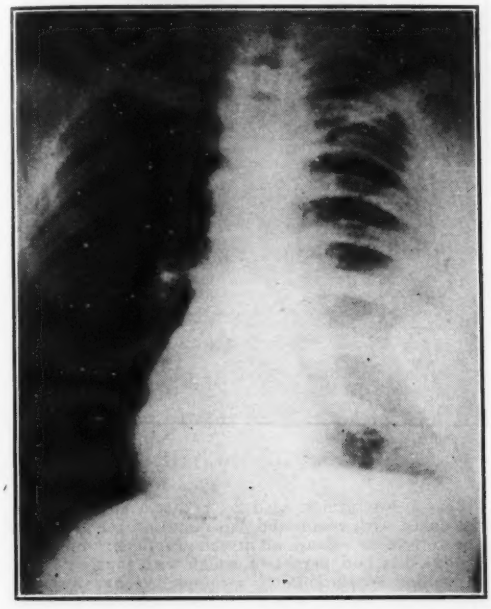
The second week after injection there was discovered an effusion about the bismuth, which distended the cavity to the size of a cocoanut. This is shown in a plate taken 26-9-19. (Fig. 2). In a couple of weeks this effusion disappeared and the cavity wall contracted on the bismuth which was slowly absorbed, as seen in a plate taken 8-3-20. (Fig. 3.)



CASE I.—FIG. II.

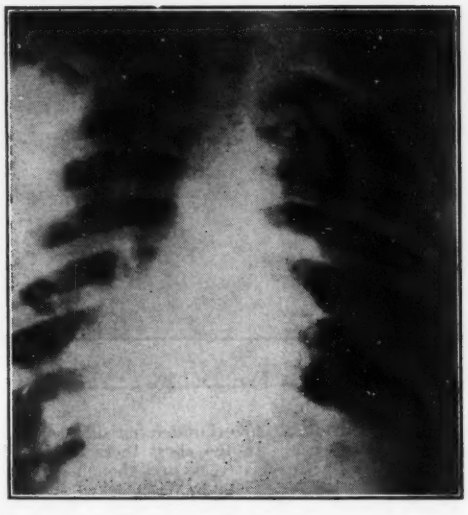
The result was most satisfactory. The patient worked as clerk until May, 1923, when he became "run down" and returned to the sanatorium. Examination

and plates showed thickened pleura and fibrosis at the site of old abscess, but no signs of abscess, nor were any of the old symptoms present.



CASE I.—FIG. III.

Case 2.—Farmer, aged 19. The onset of the present illness was pneumonic, following tonsillectomy in January, 1917. Empyaema developed which was drained by rib resection. Cough and expectoration to the extent of four ounces daily persisted. He was admitted to Saskatchewan Sanatorium on October 3, 1918, with explosive, racking cough which two or three times daily emptied an accumulation of two to four ounces of foul-smelling sputum. He was dyspnoeic, and easily tired; his weight was 6 lbs. below normal. The temperature was not elevated nor



CASE II.—FIG. IV.

the pulse rate increased. Physical examination showed a moderately nourished hardy-looking youth with no marked abnormality in tonsils, teeth or nose. The chest showed an operation scar below the angle of the left scapula. Diffuse, moist râles were heard throughout the lower half of the right lung. There were no localizing signs. A film taken 7-3-19, Fig. 4, after administration of sedatives for 28 hours, showed infiltration along the lower vertebral trunk on the left, obliterating cardiophrenic angle; there was no cavity or fluid level.

Rest and postural drainage were applied for seven months without improvement. A diagnosis of bronchiectasis was made on discharge. Four days after leaving the Sanatorium, the patient had a severe haemorrhage. Thoracoplasty in order to collapse the lung was done in two stages in January, 1920. The patient returned home in september, 1920, unimproved. He returned to the sanatorium in February, 1921 for a pneumothorax operation. The history was so suggestive of abscess that investigation was begun. Fluoroscopy and oblique plates localized an abscess lateral and anterior to the cardiac shadow. Exploratory puncture was done and 5 c.cs. of pus withdrawn. Because the lesion was superficial, he was referred for surgical consultation and drainage. Thoractomy was done, but no abscess found. He returned to the sanatorium and the infiltrated area was injected with bismuth. A film taken 14-5-21, shows multiple communicating cavities. Bismuth was expectorated in a few days. Because of multiple abscesses and failure to retain bismuth, treatment was discontinued.

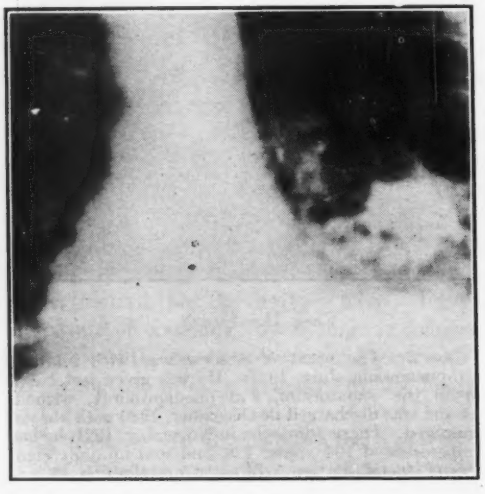
CASE II.—FIG. V.

Case 3.—The onset of abscess was with bilateral pleuro-pneumonia, July, 1917. He was given rest treatment in the sanatorium, and pneumothorax, without effect and was discharged in December, 1920 with abscess unimproved. On re-admission in November, 1921, he had a temperature of 104°, pulse 128, and spat up daily eight ounces of foetid sputum. Physical examination showed diminished resonance in right base with crepitations below the nipple and from the angle of the scapula to the lung base. There were no localizing signs. A film made 11-11-21, Fig. 6 shows an area of infiltration, with cavitation and fluid level, lateral to, and below, the right root. Treatment by rest and postural drainage for two and one-half months resulted in no improvement. On January 18, 1922, a needle was introduced, 25 c.cs. pus drawn off, and bismuth injected. The x-ray film shows the lower vertebral right trunk and abscess filled with bismuth. A film three days later shows the bronchus empty, but the abscess retaining bismuth. A film twelve days later, Fig. 7, shows the cavity two-thirds of the original size. Three

weeks after the first injection, 15 c.cs. of bismuth paste was injected. Films made 9-2-22 show the cavity much smaller than before; and two months after the second

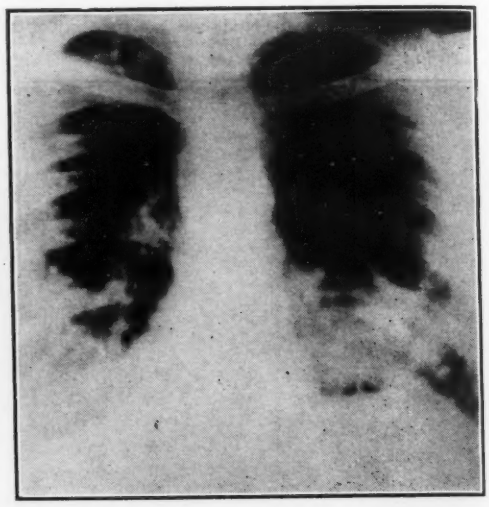
CASE III.—FIG. VI.

injection a film Fig. 8, shows the abscess cavity contracted down on a small amount of bismuth about the size of an almond. Considerable fibrosis surrounds the encapsulated bismuth.



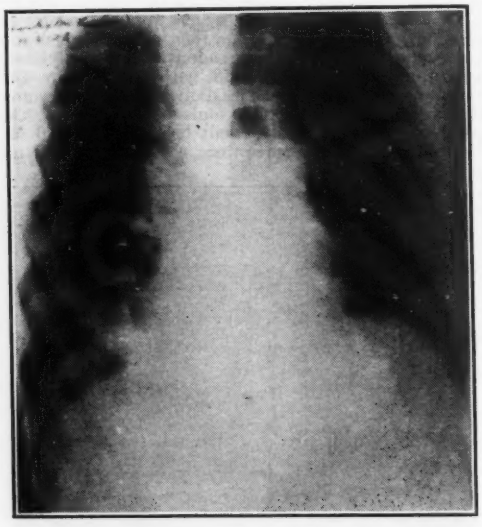
CASE III.—Fig. VII.

The result was most satisfactory. The patient gained 30 lbs. Sputum was reduced from eight ounces to one-half ounce daily and now without odour. There was still slight cough. Appetite was good, the patient felt well, and temperature and pulse were normal. One year later the patient was well and was working full time. No symptoms of abscess remained.



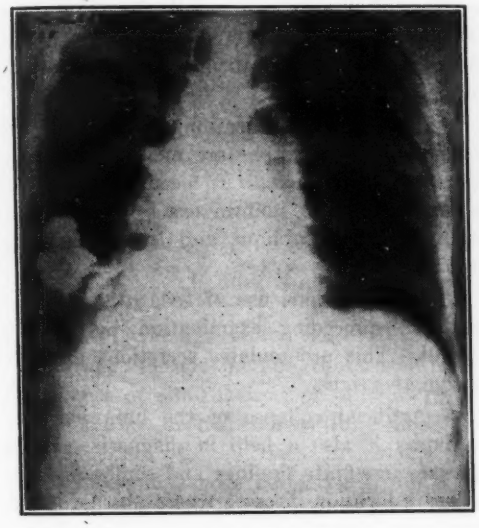
CASE III.—FIG. VIII.

Case 4.—A farmer, aged 25, giving a history of frequent colds, with cough and expectoration for as long as he can remember. Since an attack of influenza in February, 1923, has had persistent cough with four ounces of foul-smelling sputum daily, accompanied by weakness, dyspnoea and loss of weight. The cough was increased by exertion and on changing posture, especially when he lay down, the sputum welled up. Examination on admission, August 2, 1923, showed undernourished condition and severe oral sepsis. In the chest there were interscapular dullness with moist râles and rhonchi over the lower lobe of each side. There was no marked alteration of breath sounds or other localizing signs. There was marked clubbing of fingers. Stereoscopic plates showed localized infiltration in the lower lobe of the left lung. Oblique plates taken 11-8-23. Fig. 9, showed this area



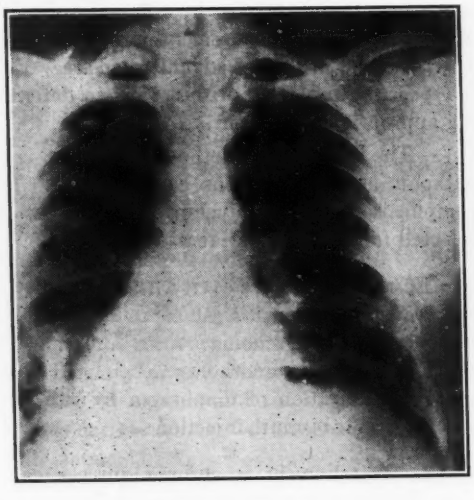
CASE IV.—FIG. IX.

to be in the postero-lateral part of the lower lobe. The needle was introduced on same day and pus drawn off and bismuth injected, until clear bismuth was expectorated. A film Fig. 10, shows a cavity the size of a hen's egg, opposite the tip of the fifth rib, filled with bismuth. A film made 27-8-23, shows about one-third of the bismuth absorbed. While another made 2-11-23, Fig. 11, shows only a very small amount of bismuth remaining.



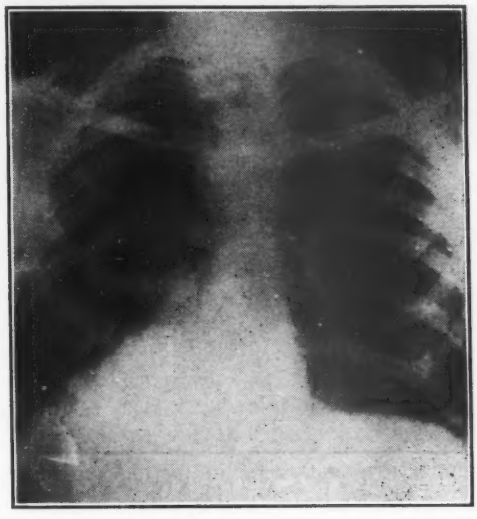
CASE IV.—FIG. X.

After three months the patient had gained 20 lbs. His strength was improved. He still had cough, but only two ounces of sputum, and the evidences of an abscess had markedly lessened.



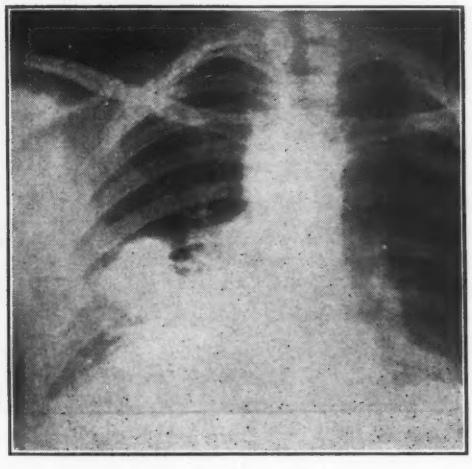
CASE IV.—FIG. XI.

Case 5.—was a mounted policeman, aged 23, whose present illness followed an attack of pneumonia in February, 1916. During the next four years there was spasmodic cough, purulent expectoration and occasional haemoptysis. Increased expectoration was noticed on exertion or on leaning over. In the spring of 1920 a severe cold aggravated this condition. During the winter of 1921-22, he was given rest and postural drainage. In June 1922, he was sent to the sanatorium. Examination showed diminished resonance in lung apices with no alteration of breath sounds. Crepitations were found below the left nipple and in the axilla. A plate made 28-6-22, Fig. 12, showed moderate thickening of the lower vertebral trunk on the right, and woolly shadows along the cardiac margin on the left, but no localized infiltration or cavity consistent with the large amount of expectoration. Exploratory puncture at this time failed.



CASE V.—FIG. XII.

Following this, pneumothorax was begun. Stereoscopic films showed the left lung partially collapsed, and a relatively clear area, possibly a cavity, at the level of the tip of the third rib. After six months, there was no appreciable improvement, so collapse was discontinued.



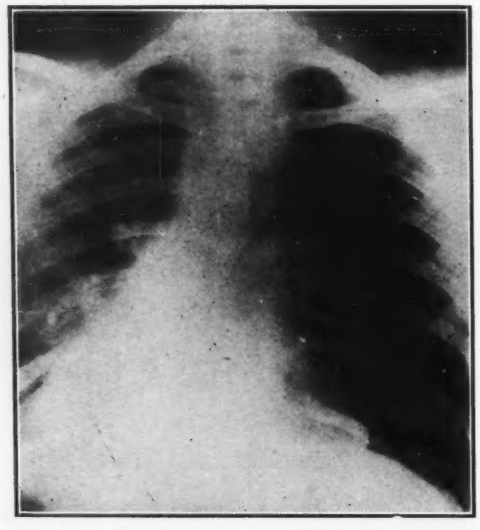
CASE V.—FIG. XIII.

On July 18, 1923, exploratory puncture was done, pus drawn off, 54 c.cs. of bismuth injected and about 50 c.cs. retained. Stereoscopic films show a large cavity filling opposite the fourth intercostal space in the mid-clavicular

line. A large amount of bismuth was expectorated in the first few days, and twenty days later a second injection was made. Films made 7-8-23, Fig. 13, show a cavity two-thirds the size of the original. A stereoscopic film, Fig. 14, made 4-9-23, shows the cavity contracting. It shows also pleural effusion which had developed in the interval, without systemic reaction. Another stereoscopic film made 10-11-23, shows the cavity a fraction of original size and the fluid cleared up. There had been a

CASE V.—FIG. XIV.

decrease in daily expectoration of four ounces, but 8-10 ounces persisted. It was decided after 17 months that a cavity existed on the right side, so pneumothorax was



CASE V.—FIG. XV.

begun. A film 15-1-24, Fig. 15, shows the right lung collapsed. This collapse resulted in a reduction of sputum from 10 to 3 or 4 ounces. A fluid level on the lower part of upper lobe indicates the location of the suspected abscess. The patient is still under treatment

CONCLUSIONS

1.—From history alone, the existence of lung abscess with bronchial fistula can generally be established.

2.—By physical examination, the approximate location of abscess can usually be determined. In chronic cases the crepitations are usually diffuse and exact localizing signs are seldom elicited.

3.—For exact localization, fluoroscopy and stereoscopic radiographs are more reliable than physical examination. To accurately establish landmarks and to confirm exact localization of infiltrated areas, oblique and transverse plates are necessary.

4.—The judicious use of sedatives for 24 to 48 hours preceding examination by x-ray is helpful. This accumulates secretions and thus exaggerates signs.

5.—Artificial collapse of the lung by pneumothorax is also a help in diagnosis. It emphasizes indefinite findings and sometimes establishes a location in cases where abscess is indicated by history or symptoms, yet where a localized infiltrated area cannot be demonstrated by physical examination, fluoroscopy or radiographs.

6.—Exploratory pulmonary puncture and bismuth injection is helpful in differentiating lung abscess from bronchiectasis and in demonstrating abscess cavity in a localized infiltrated area. This is especially important with a view to determining appropriate treatment.

7.—The exploratory method of injection is not without danger of serious complications. Five complications which developed in ten patients selected for treatment were as follows:

Effusion in abscess cavity	1
Effusion in pleuritic sac	1
Secondary pneumonia	1
Traumatic pneumothorax	1
Immobilization of diaphragm by subphrenic bismuth injection	1

8.—Injection of a chronic abscess cavity with Beck's paste has curative value in cases where the bismuth is retained.

9.—The results of treatment by pulmonary injection with bismuth paste of ten chronic cases suffering from lung abscess for an average period of just over five years was as follows:

Unsuccessful in finding abscess by exploration, 3 cases. Explored and injected for diagnosis, but untreated, 1 case.

Treated, six cases, the results being:

Cured	2
Improved	3
Unimproved	1

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NON-TUBERCULOUS PULMONARY DISEASES*

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THE cases which prompted the writing of this article do not include those well-recognized types of non-tuberculous pulmonary diseases such as bronchiectasis, lung abscesses, bronchitis, asthma, etc. Those to which I refer belong to a much more indefinite group which are continually causing considerable worry particularly from a departmental standpoint. The average run of cases admitted to a sanatorium may be roughly grouped into three classes, (1) those frankly tuberculous; (2) that large group of doubtful cases usually labelled as tuberculous suspects, and (3) the frankly non-tuberculous. Of the first group nothing further need be said, but of the other two groups further study is necessary. Following more or less sanatorium treatment, or at the time of discharge, certain revisions of the tentative diagnoses, and not infrequently of the definite diagnoses, have to be made. The frankly non-tuberculous cases sometimes prove to be more than they at first appeared. Some of them subside and are followed by more or less complete recovery; others remain more or less stationary or gravitate into chronic affections; others extend and not infrequently become complicated by a frank tuberculosis, which sooner or later overshadows the non-tuberculous process.

It is, however, the tuberculous suspect group, which furnishes the most trouble, or, to put it more mildly gives us the most food for thought. Some of these so-called suspects end up with a definite diagnosis of tuberculosis. Others leave the sanatorium still tagged with the diagnosis of suspects. Others clear up completely when the upper respiratory tract is attended to. Not infrequently diseases of the upper respiratory tract such as deflected septum, hypertrophied turbinates, polypi, inflammation of the nasopharynx, diseased tonsils, adenoids, teeth, etc., cause a chain of symptoms and signs which are definitely reflected in the lungs. When such trouble is eradicated the pulmonary symptoms disappear. Others, after careful study, seem to furnish sufficient evidence so that tuberculosis may be more or less definitely excluded, but at the same time fail to give sufficient evidence to warrant any absolute diagnosis. They unquestionably are suffering from some form of pulmonary disease, but the physical examination, laboratory reports, and x-ray fail to reveal just what that trouble is. Therefore, for want of a better name, we have classified them in a group which we call "chronic non-tuberculous pulmonary disease." It is a term which I do not like, and which, like numerous other terms in the medical sciences, serves to cover a multitude of sins. We are, nevertheless, faced with this group of cases, which, considered from a purely departmental viewpoint, it is most desirous should be definitely diagnosed. Their eligibility for treatment, and money allowances, may depend on this fact, and most certainly their pension will be affected one way or the other.

The percentage of non-tuberculous cases and tuberculous suspects admitted to any sana-

*Read at the D.S.C.R. Conference of Sanitarium Superintendents, Ottawa, April, 1924.

torium is without question quite high. The number at present at the Mowat Sanatorium reaches 35. Of these 35, 12 (or 34%) fall into the frankly non-tuberculous group; 5 (or 15%) are classed as tuberculous suspects, and 18 (or 50%) fall into the group which furnishes the substance for this paper. In other words the cases in the Mowat Sanatorium at present are classified as follows, the nominal roll at the time of writing being 100, the figures also show percentages:— pulmonary tuberculosis, 65; tuberculous suspects, 5; frankly non-tuberculous, 12; non-tuberculous pulmonary disease, 18. To show you that these figures do not represent an unusual condition, investigation of our records showed that during the twelvemonth from March 31, 1923, to March 31, 1924, there have been 111 discharges. Of this number I find 66 classified as pulmonary tuberculosis, and 45 as non-tuberculous pulmonary disease and tuberculous suspects.

At the present time most of the cases to be dealt with are appearing before the Department for the first time, *i.e.*, several years after the termination of the war. They present a group of signs and symptoms which may be subdivided into two groups. The first group is represented by the thin, emaciated, pale, anaemic individual with or without aches and pains, but with cough, expectoration, anorexia, etc. The patients in second group, in contrast to the first, are not emaciated, thin and anaemic, but are on the contrary, in what might be described as average condition. Weight is somewhat subnormal. They complain of cough and expectoration, weakness and an inability to hold down their jobs. They all give a history showing their symptoms to have been present from the time of the war or immediately following it. They all give histories of exposure during the war, and not a few relate their experiences with gas.

A careful study of these two groups of cases reveals the following. In the first group which comprises 9 cases in the present series, the loss of weight ranges from 18 lbs. or 12% to 45 lbs. or 30.61%. In the second group, which also comprises 9 cases, the loss of weight ranges from 3 lbs. or 2.14%, to 12 lbs. or 9.16%. One patient was 2 lbs. overweight. Practically all of both groups complain of more or less pain and discomfort in the chest. A history of pleurisy backed up by data, secured at the time of the examination is not a common finding. About 20% show it. Haemorrhage is also an uncommon finding. Only 8% of the present series were found under this heading. Fever is also an uncommon finding as a general rule, but all of the cases show a certain amount of fever during the exacerbations that this type of patient invariably has. Dyspnoea in varying degrees is a more common finding. Fifty per cent. were found under this heading. Fifty per cent. also appeared in the weakness column. These figures represent fairly accurately the conditions existing in the 45 non-tuberculous cases discharged during the year 1923-24.

Physical examination reveals a number of things. Certain cases show little or nothing in the chest in spite of the fact that they are definitely debilitated and have cough and expectoration and the other symptoms mentioned above. The x-ray in such cases shows a varied picture which as a rule cannot be interpreted as normal. This may be because of accentuated linear markings or a definitely enlarged hilum or irregular diaphragm shadows or hazy areas of indefinite matting or mottling or a combination of any or all of these findings. Other cases, on physical examination, reveal definite and fairly extensive pathological changes, which, when summed up, fail to conform to any definitely named process. There may be degrees of impaired resonance even up to dullness with altered breath sounds and evidence of much moisture in the chest. Râles, rhonchi, bronchial creaks, wheezes, squeaks, etc., are numerous and they extend throughout the chest or are confined principally to the lower halves of the lungs. The quantity and quality of sputum varies, but it invariably is negative by ordinary and concentration methods. The x-ray again shows a very varied picture. Some only show changes such as have been just described, while again others show extensive pathological changes of an indefinite character and of such distribution that we hesitate to attribute the pathological condition to anything with a positive name. I have examples of the x-ray picture of such cases with me and I trust that the members present will find time to review them and assist us in interpreting them.

Not a few of these patients exhibit physical

signs indicating that a certain amount of bronchitis is present, but a diagnosis of bronchitis alone does not seem sufficient to account for all the changes and especially the x-ray changes. Some of these cases also exhibit signs and symptoms indicating that a certain amount of bronchitis and bronchiectasis is present, but again such a diagnosis does not seem warranted as the data available are certainly anything but conclusive. If such a diagnosis were given, exception could easily be taken to it and it would be impossible to prove that the diagnosis was correct. The two definite things about these so-called non-tuberculous cases are:—first, their symptoms, and second, that even after prolonged investigation, we find ourselves with insufficient evidence to warrant a positive diagnosis. Occasionally animal inoculation is of assistance. When guinea-pigs are inoculated with the sputum of these cases tuberculosis sometimes develops. On the other hand, and in most instances, it does not. At the present time all the cases at the Mowat Sanatorium are being so investigated. As the work is not complete I can not tell you what the results will be. As to investigation with tuberculin, I am beginning to place less and less faith in it all the time. This allergic reaction is such that it can be modified by many things and even in definitely positive cases negative results are sometimes obtained. If a positive reaction is secured from a Von Pirquet or intra-cutaneous test, I do not consider that this is sufficient to warrant attributing the patient's disability to tuberculosis. The same applies to the subcutaneous test, unless the local and general reaction is such as to clear the diagnosis without peradventure of a doubt. Whenever the occasion arises and we have no choice but to give some diagnosis, we feel forced to tag them with this indefinite and unfortunate term, "chronic non-tuberculous pulmonary disease."

Personally I am thoroughly convinced that the majority of these cases are non-tuberculous in origin and tuberculosis is not playing any factor in the disability as exhibited by the patient. This, however, does not bring us any closer to a correct diagnosis, and when we have such cases presenting themselves for diagnosis and treatment, what are we to do? Their disability persists indefinitely and all our tests up to the present have failed to reveal the causative factor of their disease. Judging from reports which sometimes come to me from other sanatoria these cases are being definitely diagnosed as bronchitis or bronchiectasis. This I consider an unwarranted liberty and it places not only the physician but the patient in an embarrassing position.

Wheats of all the World.—It is probably not known to every reader that among the two hundred or more different wheats grown in America, there is not a wheat-growing area in the world that has not furnished at least one example. A variety known as Baart and another known as Federation, originated in Australia. A variety known as Little Club comes from Chile in South America. The macaroni wheats have a strange assortment of names, Monad, Pentad, Kubanka, Arnautka, and other strange or chemical names being applied to them. The Arnautka, strange to say, though a durum, gives the best colour of all wheats when made into bread, but lacks in the volume of the loaf. Other wheats greatly affect the volume in various ways.

Convalescent Serum in the Treatment of Erysipelas.— Eighteen patients have been treated by Harmon P. B. Jordan and Cecil C. Dustin, Providence, R. I. Of these three died, two showed questionable improvement, and thirteen showed very decided improvement. Only cases in which a marked improvement was shown in the temperature chart and in the clinical aspect have been counted as successful. The three patients who died were moribund on admission to the hospital. Convalescent erysipelas serum is simply the sterile serum obtained from the whole blood of patients convalescing from uncomplicated erysipelas. The serum may be kept for months in sterile ampules, at icebox temperature, without losing its potency.—*Jour. Am. Med. Ass.*, March 15, 1924.

SYPHILIS OF THE LUNG*

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History

SYPHILIS of the lung is a disease which has recently been rediscovered. It was known to pathologists of the 16th and 17th centuries. Paracelsus mentioned it, Paré, Boerhaave and Morgagni diagnosed it, Virchow described its microscopic anatomy and the Russians, Pavlinoff and Sacharjin called it syphilitic pneumonia. Its existence was forgotten in the excitement caused by the recognition of the tubercle bacillus. The new knowledge drove out the old and a generation of physicians grew up who did not think of the possibility that many pathological conditions of the lung might be related to syphilitic infection. Even when the spirochaete was discovered, nearly twenty years ago, and when some cases of pulmonary disease were ascribed to its invasion of the lung, little or no attention was paid to the suggestion. The vast majority of clinicians refused to accept the diagnosis. The tubercle bacillus still occupied the centre of the stage and round it were grouped a motley collection of "non-tuberculous" conditions, not otherwise differentiated.

It was not until Warthin's epoch-making monographs, published in 1918, had elucidated and elaborated our knowledge of the pathological histology which results from infection with syphilis that it began to be recognized again that certain forms of disease of the lung might be due to this infection. At about the same time attention was attracted to the condition as a result of reports from the Phipps Institute and from European clinics. In these syphilis was suggested as the explanation of some groups of cases which had failed to react to routine treatment for pulmonary tuberculosis. Speaking generally these presented the usual signs and symptoms of phthisis, except that repeated sputum examinations were constantly negative and the diagnosis could, therefore, not be definitely established. Except for this, no doubt of the nature of the disease had previously existed. With a rapidly growing appreciation of the activities of the spirochaete, the existence of pulmonary syphilis has, in the last few years, sprung into prominence and the condition is now recognized as being very much commoner than had formerly been suspected.

Incidence.

No statistics regarding its incidence are of much value. The published figures vary from one case of pulmonary syphilis in the 13,000 compiled by the Surgeon General at Washington, to 12 cases in 152 syphilitics collected by Carrera in Warthin's laboratory. At the University of Iowa some four proven cases were described in 72 autopsy records. The fact is that our knowledge of the condition is as yet too recent and the signs upon which an absolutely positive diagnosis may be made too uncertain, to permit us to draw any conclusions in regard to the frequency of the disease.

Pathology.

The whole question of its pathology is still under debate. The discussion lies between the pathologist who insists upon definite and absolute anatomical proof, and the clinician who so far has had to be content with a summing up of the probabilities and of the effects of treatment and has based his conclusions upon these. The former denies the prevalence of the condition, while the latter is becoming more and more of the opinion that many cases now classified as non-tuberculous infection, and not a few diagnosed as tuberculous, are in reality syphilitic. The reason for this appears from a consideration of the essential pathology of the disease. The most recent investigations have established the fact that the low grade inflammation resulting from the invasion of the tissue by the spirochaete is essentially an infiltration of the perivascular lymph spaces with fibroblasts and plasma-cells. The consequent gross pathology depends upon the severity of this process. If this is marked and rapid, ulcerations occur in the superficial tissues, while in the deep tissues gummata are formed. If it occurs more slowly and less severely a spreading fibrosis results. It must not be overlooked that at the same time arteritis occurs and

*Read at the D.S.C.R. Conference of Sanitorium Superintendents, Ottawa, April 1924.

it has been suggested that a somewhat analogous proliferation of the lung epithelium may occur, especially in the bronchioles and alveoli.

With these facts before us let us visualize the effects of the invasion of the lung by this organism. It would appear from the clinical records that this invasion is more commonly slowly progressive than rapidly extensive. Cases in which the process has been rapid are, of course, fairly well known. In these circumstances usually one large gumma occurs. Occasionally a softening of its centre or of the coalescence of a group of gummata leads to cavity formation. When the more usual slow infiltration of the perivascular lymph spaces occurs, there is a gradual fibrosis of the lung with at the same time a more or less marked degree of endarteritis and accompanying this an obstruction of the finer air passages. Such pathological reports as are available indicate that this process is what actually does occur and a few typical cases are quoted.

Dr. Howard, University of Iowa, quotes a case of syphilitic stenosis of the trachea with lung-fibrosis. At autopsy examination the following findings were made: The lungs were voluminous and crepitant, firm to touch and cut with marked resistence. The trachea at the point of contraction was about one-half the size of a lead pencil. Histological examination revealed only a remnant of mucosa with marked increase of stroma. Cross-section revealed round-celled infiltration of lymphocytes and plasma-cells, especially marked around the vessels. The remainder of section was made up of dense connective tissue partly hyalinized in places. Examination of the lung revealed all stages of pathological changes. There were marked alterations in the pleura and perivascular and peribronchial infiltration where increase both in the amount and density of connective tissue was evident and often associated with infiltration by lymphocytes and a few plasma cells. In some areas there was a connective tissue proliferation in the alveolar walls, in some cases extending into the alveoli as loose-meshed tufts not unlike organized pneumonia. In other places there was merely an increase in the normal connective tissue stroma, and elsewhere striking broad bands of loose connective tissue containing fibro-blastic nuclear forms. The arteries of every calibre and in all sections showed practically the same changes in varying degrees. There was noted a widespread increase in the adventitia frequently amounting to dense fibrosis which frequently extended to the neighbouring alveolar wall in which many areas showed lymphocytic infiltration. The muscle and elastic fibres were replaced by fibrosis. In many of the small vessels the lumen was markedly reduced and in some cases completely obliterated by fibrous tissue.

Dr. Fernand Bezançon describes a case in which both lungs were sclerosed, the left lung bound down to the pleura and diaphragm. In the cut sections small hard homogeneous nodules, greyish white in colour, varying in size from a pin's head to the size of a pea, with all the characteristics of small gummata, were found. In the neighbourhood of the hilus the large bronchi were found to be cylindrically dilated. Histologically, was observed a symmetrical extremely dense sclerotic area made up of organized fibrous tissue extremely vascularized by arterioles showing endarteritis almost to the extent of obliteration. The capillaries were thin walled and almost reduced to endothelium. In the dense framework of fibrous tissue were noticed small isolated bundles of fibres which had lost all connection with the vessels, which latter had probably been obliterated. The dilated bronchi had completely lost their elastic and muscular coating and the external layer was reduced to fibrous rings. The mucous lining was greatly thickened and infiltrated with lymphocytes and plasma-cells and was vascularized with distended capillaries reduced to their endothelium.

One other pathological reaction to spirochaete invasion deserves mention. Admittedly its occurrence has not been definitely demonstrated by post-mortem findings, and conclusions regarding it must therefore be drawn from clinical observation and deductions from observed tissue reactions elsewhere. I refer to the acute inflammation of the mucous membranes.

It has been suggested that an acute inflammation of this type occasionally arises in the second stage of syphilis in the mucous membrane of the bronchial tree. The only evidence in support of this theory is found in those cases of acute bronchitis in which the Wassermann reaction has been found to be strongly positive and the chest condition has disappeared when anti-syphilitic treatment has been vigorously given.

Symptoms.

The onset of the symptoms is almost invariably slow and insidious. The order of their frequency is quite generally agreed upon. The first and most prominent is cough, usually dry and un-

productive, and occasionally worse at night. It tends to become constant and spasmodic on exertion. Very rarely, in the earliest stages, it may be scarcely noticeable. Haemoptysis, generally slight in amount and showing a tendency to recurrence, is common. Large haemorrhages have been reported. Dyspnea becomes more and more easily produced as the disease progresses. Pain in the chest is commonly present and is due to involvement of the pleura. Expectoration increases with the progress of the condition and in those cases with bronchiectasis or cavitation it is copious. In most cases there is loss of weight and slight fever may be present.

From this it will be observed that speaking generally the clinical picture is distinguishable only with great difficulty from that produced by pulmonary tuberculosis. If, however, each of these symptoms is contrasted with its analogue in the latter disease, differences become apparent. It is generally agreed that cough is not a marked symptom in uncomplicated pulmonary tuberculosis. It is always present but is usually inconspicuous. It is evidenced more by expectoration than by its own prominence. Expectoration is the symptom *par excellence* in tuberculosis. In its absence very positive signs and symptoms must be present before a diagnosis can be made. Haemoptysis occurs in less than 25% of early tuberculosis, and is usually accompanied by other quite definite symptoms and signs. The absence of these is the rule in pulmonary syphilis. In early phthisis dyspnoea is almost unknown. It is never a characteristic symptom of the disease except in those cases in which extensive fibrosis has occurred. Its frequency in pulmonary syphilis is easily explained by the pathology above outlined. Pain in the chest cannot be said to be a prominent symptom of tuberculosis. When present, pleuritis is usually demonstrable. Its occurrence in syphilis of the lung is due to the comparatively frequent development in this condition of mediastinal, perihepatic, or pleuritic involvement. The slight fever and loss of weight are almost as definitely symptoms of second stage syphilis, frequently overlooked, as they are of pulmonary tuberculosis.

In brief the patient with uncomplicated syphilis of the lung presents himself complaining of cough with little or no expectoration. He may give a history of one or more slight haemoptyses. He says that he is gradually becoming more breathless on exertion. He may have lost some weight and be found to have a slight fever, but he will present few if any of the evidences of the debility and fatigue that are so characteristic of an active tuberculous lesion. If his blood Wassermann is strongly positive he should be classified at once as a case of syphilis, and the onus of proving himself tuberculous should, as it were, be placed upon his own shoulders.

Physical Signs.

The physical signs usually presented by a case such as that just described will usually be found to be much more extensive than the clinical picture suggests. The old idea that the disease occurs only in the lower and middle lobes has been discredited by the Karshners, Lewis, and some others, but it is to be noted that Watkins, quoted by Hoover, states that infiltrations tend to follow the larger arterial trunks and are, therefore, more commonly found radiating from the hilus towards the middle and lower portions of the lung. Lewis, on the other hand, describes several cases in which the lesion was most marked in the apex, thus rendering the differential diagnosis more difficult.

The signs described by the various authors resemble so closely those of tuberculous disease as to render any detailed remarks unnecessary. They may, however, be conspicuous by their absence. They may imitate exactly tuberculous lesions of the apex. They may be the result of a more or less generalized and extensive fibrosis not infrequently involving the base of one lung. Thickening of the pleura is frequently found.

The picture may, in the later stages, be complicated by the development of a bronchiectasis, or more rarely by cavity formation which has resulted from the breaking down of a gumma and the extrusion of its contents into a bronchus. Radiologically the most characteristic finding is extensive fibrosis. This is observed extending outwards from the hilus along the bronchi. There may be dense shadows of variable extent in which occasionally lighter areas are seen. The shadows may simulate those of primary carcinoma or partially unresolved pneumonia. The edges of these are dense and usually irregular with projecting fibrous bands radiating from them. It will be appreciated from the remarks made a few minutes ago in regard to the essential pathology of this disease that the infiltration and fibrosis which occur may lead to contractions which bring about stenosis of a bronchus and consequent collapse of the lung area involved. The contraction may also distort the bronchial tree and

thus give rise to the bronchiectasis which appears to be a fairly common development in the later stages of the disease.

Diagnosis.

It will be obvious that the disease is protean in its aspects and that no group of symptoms and signs can be considered pathognomonic. The main features upon which the diagnosis is based are the repeatedly negative sputum examinations, the failure to react to sanatorium treatment, and the presence of a positive Wassermann. The diagnosis has heretofore been usually arrived at by a process of exclusion. It is not impossible that as our knowledge of the condition increases, we may be able in the future to make it as rapidly and as certainly as we make the diagnosis of active pulmonary tuberculosis today. One should invariably search for other characteristic signs of syphilis. Of these, the most constant is said by Warthin to be an atrophy and hardening of the testicles. The only completely satisfactory diagnostic proof that is known today is found in the reaction to anti-syphilitic treatment. When the patient with a positive Wassermann, who has exhibited evidences of disease of the lungs is cured of this condition as the result of vigorous antiluetic medication, there can be no reasonable doubt that the pulmonary condition was due to the activities of the spirochaete.

Association with Pulmonary Tuberculosis.

The fact that syphilis and tuberculosis may be simultaneously present in the same lungs, adds very greatly to the difficulties of the situation. When infection with both diseases occurs at the same time, the tuberculosis generally runs a very rapid and fatal course, while the course of the syphilis does not appear to be altered. When a syphilitic develops an active tuberculosis, the latter disease usually progresses slowly. It has been suggested that this results from the fact that the lung has been well fibrosed by the syphilitic process. The symptoms are largely those resulting from the fibrosis to which infiltration of the apices may be added. No specific information has been found in regard to the results to be anticipated if a case of active tuberculosis becomes syphilized, but from such indications as are available it would appear that in this class the course is similar to that which obtains in the cases in which the infections occur simultaneously, namely that the tuberculous disease progresses very rapidly to a fatal termination.

Treatment.

It appears to be the general consensus of opinion that if syphilis of the lung is discovered, anti-syphilitic treatment should be vigorously undertaken. There are no reports indicating that these measures have ever had a detrimental effect upon a coexisting tuberculosis. It is to be noted, however, that the administration of the iodides is not advised. The drugs recommended are salvarsan and mercury.

Conclusion.

It seems to be definitely established that syphilis of the lung does exist and that it is of more frequent occurrence than has heretofore been recognized. With a positive Wassermann, with or without other syphilitic stigmata the diagnosis of "tuberculous suspect" should not be made until a therapeutic test has been applied. In the presence of syphilitic stigmata, any obscure lung pathology should be considered as syphilitic until proven otherwise.

In addition, it is suggested that further study of this condition may establish the primary etiology of some of the cases of chronic bronchitis, bronchiectasis, and chronic fibrosis that occur in middle-aged and elderly people. From the reports, it is by no means impossible that a large percentage of these, particularly those in whom no other obvious etiological factors are discoverable, are due to a syphilis acquired many years earlier, in the days of their hot and unregenerate youth.

Rheumatic Heart Disease in Children Under Two Years of Age.—In three cases of carditis in children under 2 years of age, related by B. S. Denzer, New York, the rheumatic origin has been proved by finding either subcutaneous fibroid nodules or Aschoff bodies. Denzer believes that careful search for these may lead to the discovery of a greater number of cases of heart disease in infancy of rheumatic origin.—*Jour. Am. Med. Ass.* April 19, 1924.

OVER-DIAGNOSIS OF PULMONARY TUBERCULOSIS*

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THE first medical writers whose works we know, appreciated the value of early diagnosis in pulmonary tuberculosis and Hippocrates is said to have written, "Phthisis is a disease which when incipient is hard to diagnose and easy to cure but when far advanced is easy to diagnose and hard to cure." Appreciation of this dictum has been augmented by time and every addition to our knowledge of tuberculosis has substantiated its truth. The introduction of systematic sanatorium treatment, the realization of the infective nature of tuberculosis, the staining and recognition of the tubercle bacillus, and the wave of optimism consequent upon the introduction of tuberculin, have all in turn increased the demand for early diagnosis until now it is recognized as a *sine qua non* of adequate treatment. Realizing this, a vigorous campaign has been waged to the end that tuberculous people may have early diagnosis. No campaign among medical men has been so energetically prosecuted and few have been so successful. As a result the medical profession at large is now thoroughly awake to this responsibility and recent graduates who are not fired with the ambition to discover tuberculosis at its inception must indeed be unresponsive. The unquestionable achievement of this campaign in assisting to reduce the tuberculosis death rate is generally recognized and the necessity for its propagation is a maxim for tuberculosis workers. It has, however, an undesirable by-product which must be recognized and guarded against. This by-product is over-diagnosis. It is the object of this paper to call attention to the existence of over-diagnosis, to deal briefly with some of its causes and effects, and to suggest that it may be largely obviated by tempering the ardour for early diagnosis with a more comprehensive knowledge of the conditions simulating incipient tuberculosis, and by reconsideration of the commonly accepted ideas in connection with its onset and course.

Proof of the existence of over-diagnosis is scarcely necessary. The most striking examples of it were seen during the war. In the French armies it became so flagrant that the fighting efficiency of the army was threatened. There were 87,000 French soldiers taken out of the line early in the war, with alleged pulmonary tuberculosis, and only 27.5% of these had the diagnosis confirmed. Anti-war propagandists in America used the high tuberculosis incidence in the French army as an argument against participation. In our own army the situation was scarcely less serious, and you all remember that extraordinary regulation considered necessary by the authorities which disallowed all diagnosis not supported by laboratory findings. Though general rules formulated under war conditions do not necessarily apply during peace, it must be assumed that the state of affairs during the war indicated a general tendency in the profession to inculpate the tubercle bacillus unjustly. This assumption is borne out by the experience of some sanatorium men and is even more strongly corroborated in private practice, where, the negation of diagnosis assumes as important a position as their confirmation. One sometimes thinks that the diagnosis of tuberculosis is becoming almost as popular as a diagnostic catch-all as "rheumatism", the former being a general debility without pain and the latter a general debility with pain.

The responsibility for over-diagnosis cannot, with so many others, be thrust unceremoniously upon the long-suffering shoulders of the general practitioners, and indeed tuberculosis specialists have become almost offensive in their insistence that he habitually fails to see tuberculosis where its presence is manifest. It is against a group of chest specialists themselves that the specific charge of persistent over-diagnosis must be particularly directed. These zealots striving to exterminate tuberculosis, ignore in their enthusiasm, concrete things, and see the enemy where he is not. They fail to appreciate the many other conditions that may produce a symptom-complex similar to that of tuberculosis and may explain all the ills of a lifetime by some slight divergence from what is conceived to be the normal physical, serological or radiographical findings.

The causes of this tendency to over-diagnosis are many. One is undoubtedly that emotion

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which is parent to many of our errors, namely, *fear*. The consequence to a physician who frequently misses pulmonary tuberculosis, are most damaging; in the eyes of the profession he is inefficient, and in the eyes of the patient concerned he is the one cause of all the vicissitudes of his subsequent illness. In contrast to this the physician who oversteps in his statements pays no penalty and indeed his tendency to anticipate disease may indirectly contribute to his reputation as a therapeutist. In view of this, it requires definite courage to firmly negate a diagnosis or indeed to declare any suspected chest quite sound. Our instinct of self preservation asks us to acquiesce in safety and it requires very little rationalisation in most cases to justify ourselves. Real fear of missing a diagnosis is no doubt a salutary emotion; its use ends when it has impelled us to take every diagnostic precaution: when it enters as a factor in deciding for or against, it is an actual menace to accuracy.

That the *history* can make a diagnosis of tuberculosis is an unjustifiable belief and sometimes leads to ill advised conclusions. There are no symptoms or combinations of symptoms found in tuberculosis, which are not also found in other conditions. Cough and expectoration are more common and more troublesome in other respiratory conditions than they are in tuberculosis; general weakness, lassitude and fatigue are more common in functional disorders; palpitation, tachycardia and faintness are more suggestive of some endocrine dyscrasia; hæmoptysis is as frequent in bronchiectasis and in mitral stenosis as it is in tuberculosis; a conclusive history of unexplained pleurisy with effusion is probably the most significant of any evidence that may be gathered from history alone. In any event, the history as given by the patient is at best a rickety foundation upon which to build. It records chiefly, the spotty and inadequate recollections of the patient and the clinical bias of the recorder. Particularly in our day of pensions, compensations, and insurance, when a definite diagnosis is often a financial asset, histories should be well supported by concrete evidence before they are used as diagnostic material.

Another circumstance contributing to over-diagnosis is the unwarranted multiplicity and fantastic refinement of the *physical signs* ascribed to incipient tuberculosis. As early as 1846 Addison protested against undue reliance on physical signs and says "To strip the stethoscope of the extravagant and meretricious pretensions thrust upon it by injudicious friends, to make a candid acknowledgment of the manifold difficulties and fallacies to be encountered in its employment, to state fairly what it will not, as well as what it will do, is surely calculated to render it some service." This warning against undue reliance on physical findings applies even now. A description of all the physical signs alleged to be significant of pulmonary tuberculosis is to-day so intricate and voluminous as to obscure the essential and all important criterion, namely, post-tussic crepitations. If we made and unmade diagnosis on that sign alone our average accuracy would be a great deal better than that of the Canadian Army Medical Corps during the war.

Badly taken and incorrectly interpreted *x-ray films* are frequently responsible for placing the stigma of tuberculosis upon "innocent suspects". While good plates, read by one qualified to correlate them with the other features of the case are undoubtedly our most valuable aid to diagnosis, bad plates, in the hands of a novice, are not only useless but dangerous. The belief that screen examination is sufficient to give a decision for or against pulmonary tuberculosis is unwarranted. While there are a few individuals whose percentage of errors with this method is quite small, it is, as used by the average radiologist or internist of limited value and should not be depended upon. Though most errors in radiological diagnosis are due to bad technique, insufficient training, and dependence on the screen, there is still some over-diagnosis for which none of these are responsible. This is principally caused by a too serious conception of hilum and peri-bronchial shadows. Though these are no doubt often associated in some way with tuberculous infection, their relation to active pulmonary tuberculosis as a clinical entity is usually remote and unless there is some other strongly corroborative evidence they should not be interpreted as indicating disease.

The *belief in a discoverable incipient stage* in all cases of pulmonary tuberculosis is one that contributes to over-diagnosis and its modification would be a service to accuracy. In truth the ambition to find incipient disease, though noble is rarely realized. This failure has in turn been attributed to the inefficiency of the profession and to the carelessness of the public. While both of these factors may contribute to some extent, the chief reproach should fall elsewhere. The fact is that incipient pulmonary tuberculosis as a

clinical entity is an exceedingly rare condition and the only culpable party is the tubercle bacillus. It believes in surprise tactics and mass attacks, and the actual onset of active tuberculosis is frequently pneumonic and gross from its inception. This is borne out by what we know of re-infection and is supported by x-ray findings. It accounts for the disappointment we all felt in the x-ray when it failed to disclose all the fine gradations from a few isolated tubercles to a gross involvement. We have had to admit that there is a missing link. This conception of adult pulmonary tuberculosis being essentially a disease of sudden attacks is not universally accepted and there are those who believe that it progresses slowly and regularly and has not only a definite and discoverable incipient stage but also an occult or subliminal stage in which the tubercle bacillus remains hidden in some obscure tissue causing no demonstrable lesion but still producing general debility.

The blanket *occult tuberculosis* covers all those cases that do not show physical or x-ray signs of pulmonary tuberculosis but have suggestive symptoms. Its introduction has contributed largely to over-diagnosis. These cases attempt to supply the missing link which preconceived ideas demanded of the x-ray and which probably has no actual existence. The cases labelled as occult tuberculosis are drawn from a large and unfortunate class of people who complain of weakness, loss of weight, nervousness, palpitation, sweating, over-emotionalism, etc. These patients are frequently diagnosed according to the idiocyncrasy of the medical attendant; they are called effort syndrome by the heart specialist, neuroses or psychoneurosis by the neurologist, hyper-thyroidism or focal infection by the surgeon, and occult tuberculosis by some tuberculosis enthusiasts. If, to the above general symptoms is added an enlargement of the thyroid or some chronic abdominal pain, innocent blood is liable to be spilled at the hands of a surgeon; if the general symptoms are supported by some peribronchial infiltration in the upper part of the lungs or some suggestive serological reaction, the diagnosis of tuberculosis may be made. This group of cases is admittedly a difficult one to classify correctly and will frequently prove intractable to treatment. There is, however, one service that chest specialists can do them and that is firmly to dispel their fears of tuberculosis and resist the temptation to keep a string on the diagnosis for safety. They frequently carry the diagnosis of tuberculosis for years, in spite of the continued absence of post-tussic crepitations, parenchymatous x-ray shadows, hæmoptysis, pleurisy, or positive sputum. A diagnosis of occult or subliminal tuberculosis should never be made. If there is enough tuberculosis to give general symptoms it must be so gross that it cannot remain hidden. As a general rule it takes a good deal of tuberculosis to produce general symptoms. Testes, kidneys, lungs, and glands may go on to gross disease without general symptoms and they frequently do. In the face of this, it is hard to imagine some minute hidden focus of disease producing enough toxin to debilitate a patient seriously for a period of years.

The *results* of over-diagnosis are more serious than is usually recognized. It has been maintained that this weakness is comparatively harmless because the form of treatment that it predicates is good for most conditions commonly confused with tuberculosis. This argument, if sound, robs accuracy in diagnosis of its virtue. It, however, is not sound. Over-diagnosis of any sort is bad; bad for the patient physically, financially, and psychically; bad for the physician mentally and morally; bad for the country economically. The psychic effect on the patient is one much to be deprecated. In our day we appear to have more than our share of functional disorders to cope with. This is unquestionably in a large degree due to over-diagnosis by the patient, by the irregular practitioner, and by the physician. None of us resist well the temptation to invoke pathology to account for subjective symptoms, though we know that more than half of these have no demonstrable organic cause. If a patient is given a peg of pathology upon which to hang his neurotic hat he is firmly settled for many months. It is one duty of the medical profession to keep these pegs out of reach and lose no opportunity to reassure and encourage apprehensive individuals. Heart disease, cancer, syphilis, and tuberculosis are the common diseases about which neuroses are built since they are the chief agents of death. It is therefore particularly desirable to obliterate them from the gloomy landscape as soon as possible.

Possibly the most deplorable consequence of the premature diagnosis of tuberculosis is that *further investigation is paralysed.* The case having been labelled may be forgotten, at least for the time being. This is particularly unfortunate in the groups of cases involved because it is a

group that requires and deserves more investigation than any other.

It is unnecessary to dilate on the economic aspect of this question. Besides the loss of time to the patient, there is, in the army, the pension aspect, and in civil life, the general economic loss to consider. When a chest specialist writes, "This is pulmonary tuberculosis" he is signing his country's name to a cheque for several thousands of dollars. Though this point of view is trite, its appreciation during the war would have resulted in a saving of many millions for the Dominion, and since the care of the tuberculous civilian is becoming more and more a public liability, it has its application in private practice.

There are many difficult cases in which the presence of the tubercle bacillus as an active agent must remain at least for a time in doubt, and no one expects to eliminate all over-diagnosis; it, however, may be largely reduced by an appreciation of the following propositions:

1.—Over-diagnosis is an evil, comparable in its results to under-diagnosis and correctly negating a diagnosis of tuberculosis though more disagreeable and more dangerous is as highly to be commended as is the finding of an early case.

2.—Slight variations from what are conceived to be normal physical findings unsupported by post-tussic crepitations, or x-ray shadows in the lung parenchyma are insufficient evidence of pulmonary tuberculosis even in the presence of general symptoms of debility and cough.

3.—Occult tuberculosis, subliminal tuberculosis, peribronchial tuberculosis, *et hoc genus omne*, are not sufficiently proven to warrant their use as final diagnoses.

4.—The presence or absence of localized, peripheral, parenchymatous shadows, in well taken x-ray films, is by far the most important point in making or breaking a diagnosis of early pulmonary tuberculosis. It is imperative that the clinician himself should have the facilities to search for and the training to recognize these radiographic changes.

THE RELATION OF DISORDERED HEART ACTION TO THE DEVELOPMENT OF TUBERCULOSIS—A REVIEW OF THE HISTORY OF A SERIES OF 500 CASES*

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EXPOSURE and fatigue during the War impaired the health of many of the soldiers and amongst their illnesses are symptoms which are generally attributed to affections of some part of the circulatory system. The descriptions of exhaustion correspond with the symptoms present in the condition described as "Soldiers' Heart", or "Irritable Heart of Soldiers", or, to use the name contributed by Lewis "Effort Syndrome". It is not a new condition. The British Government in 1864 appointed a committee to enquire into the heart complaints of soldiers, as the condition we recognize to day was the cause of much discussion at that time. During the American Civil War, surgeons had ample experience with this trouble. Articles published by Hartshorne and DaCosta are almost identical with the descriptions given by army doctors during the late War.

Soldiers invalided because of heart trouble show a great deal of variation in their appearance and symptoms; the face is often lined and drawn; many are spare and thin with vasomotor instability, as shown by the manner in which the peripheral circulation varies in the hands and fingers. When treated by rest and feeding, they become pale, fat and short of breath. Chest complaints are not absent. There is a feeling of impaired well-being. They are easily exhausted, breathless on moderate exertion, and complain of pain over the heart. The heart rate is often not increased; at least, the rate may be quite moderate but even slight exertion produces undue rapidity; systolic murmurs are frequent in various areas. There may be a slight increase in the size of the heart or an increase in the force of

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impulse, the point of impact being slightly dislocated outward. Mentally, they are subject to depression and irritability.

Twenty to thirty per cent. of cases admitted to hospital for shell shock develop symptoms of effort syndrome. Neurasthenic symptoms are common among these D.A.H. pensioners. They are readily subject to suggestion and yield to all the restrictions. They are ready to lie in bed and indulge in introspection. The condition is similar to that following exhausting diseases, such as typhoid fever. The onset is gradual, usually following a strenuous life in the trenches or some predisposing illness, the condition becoming apparent during convalescence or shortly after a return to active operations. Mental strain, exhaustion, or sleeplessness during the stress of actual warfare has been found to produce the condition. Identical symptoms may be present in those who have never been to the front.

Sir James McKenzie states that "the action of toxins produced in the body by bacterial infection has not yet been clearly worked out, but so far as I have gone into the matter, a clear distinct group of illnesses can be attributed to toxins. Even when the organisms themselves do little damage, the general exhaustion and circulatory system disturbance are part of a general manifestation. It is just possible that in some of these cases there is an actual invasion of the heart by some microbe and these symptoms may be a precursor of chronic myocarditis, but so far this matter is but a surmise."

It is, however, abundantly clear from the symptoms and physical signs, and these various possible causes, that effort syndrome is more of the nature of a group of symptoms than a clinical entity. The same phenomena are common in civil life and occur also in women and children. The facts appear to be that even normal persons may at some time suffer from disordered heart action after some unwonted exertion, and after ordinary exertion an individual in a lowered state of health may suffer from pain in the chest, palpitation, and dizziness. In others the symptoms may signify the onset of some organic disease.

The term "Effort Syndrome," "D.A.H." or "Soldiers' Heart," therefore, describes a group of symptoms and signs, independent of the manner in which they are brought about or the disease from which the patient actually suffers. Its use is restricted to those patients in whom a definite diagnosis has not as yet been accomplished. Naturally, as soon as the true nature of the malady becomes clear, the term must be abandoned. Lewis divides subjects afflicted with effort syndrome into six classes:

1.—One of the largest groups is that of constitutional weakness, nervous or physical, or both, including those of incomplete or imperfect development to which belongs many undersized men with flat or elongated chests; those with bad family histories tainted with insanity or epilepsy; or those who in childhood were nervous weaklings. Many of this class, once in the army, discovered a name for a life-long disability and also realized that it had become an actual asset. Training weeded out the more pronounced cases. Injudicious training no doubt aggravated a certain proportion.

2.—Those who may be regarded as played out by exposure, hard continuous work, or disturbed sleep.

3.—Those who may be regarded as exhibiting some acute illness such as pneumonia, pleurisy, rheumatic fever, dysentery, trench fever, severe influenza, or tonsilitis.

4.—That group whose disability is due to unrecognizable infection including incipient tuberculosis or tuberculosis in a stage of healing.

5.—Gas poisoning.

6.—A small group in which incipient though unrecognizable heart disease is present.

23%	followed	rheumatic fever or chorea.
12%	"	pyrexia of unknown origin, or influenza
8%	"	enteritis.
6%	"	dysentery.
8%	"	tonsillitis.
3%	"	pleurisy.
2%	"	trench feet.
16%	"	other diseases.
6%	"	pneumonia.
5%	"	scarlet fever.
4%	"	shell shock.
3%	"	gassing.
3%	"	bronchitis.
3%	"	malaria.
2%	"	venereal disease.
1%	"	trench fever.
18%	"	no past illnesses.

As we study a group of soldier patients and follow them up as pensioners in subsequent years, we weed out a proportion in whom a more definite diagnosis is possible. Some pensioners, after a later date, have been shown to be suffering from mitral stenosis, aortic insufficiency, chronic appendicitis, syphilis or chronic gonorrhoea; some develop recognizable signs of pulmonary tuberculosis; some are restored to health.

Of Meakins' and Priestley's series of 700 gas cases, May 1915, 188 were investigated four

years after gassing, and of these 78, or 41.5% showed signs of disordered action of heart: in 26 cases symptoms of bronchial asthma developed; D.A.H. persisted in 10% and bronchitis in less than 5%. There were no proven cases of tuberculosis. When the pathological nature of the lesions produced by the gas was first realized, it was anticipated that severe emphysema, tuberculosis, and chronic hæmorrhage would follow. None of these dark predictions have been justified. Bronchitis and emphysema as sequelæ are relatively rare; tuberculosis extremely so. The commonest feature has been debility associated with disordered heart action which developed in 30% of cases of severe exposure to gas; of these many responded to graduated exercise In a certain proportion, however, this disordered action of the heart persists, with a rate as high as 160 per minute, and a persistent shortness of breath. In another series of figures on the effects of irritant gas on the respiratory tract, quoted in the *American Review of Tuberculosis*, there was dyspnoea, laryngitis, occasional hæmoptysis, tachycardia and asthmatic attacks. Sixty-five per cent. were fit for discharge within 5 weeks; 5, namely 3%, were discharged permanently unfit; 1, namely, ½%, had tuberculosis. Out of 162 cases reported by Guilhame, 2 developed tuberculosis.

If tuberculosis is often overlooked, or if disdisordered action of the heart is a frequent antecedent of tuberculosis, we would expect to find it among pensioners for disordered action of the heart; yet an analysis of 500 files of ex-soldiers discharged and pensioned for this affection in 1919, shows that 17 have subsequently been placed on pension for tuberculosis, namely, 3.4%. Analysis of these 17 cases shows 10 to be definitely tuberculous, sputum positive cases, 4 in which the diagnosis could not be held to be more than tuberculosis suspects, and 3 arrested or apparently cured cases. In the 10 definite cases of tuberculosis, the clinical progress from the first diagnosis of D.A.H. was a fairly clear and definite unfolding of the final designation. The diagnosis was reached within two years and affords ground for a reasonable doubt that the two conditions were associated. Taking the normal incidence of tuberculosis for corresponding ages in the civilian population as 2%, and allowing for a slight preponderance among males, it will be seen that the definite cases of tuberculosis in this series are not very different from the normal. It is doubtful whether, taking a similar series of 500 pensioners, discharged and pensioned for any debility, bronchitis, gassing, or even myalgia, might not give an equal percentage. The more remote the occurrence of disordered heart action the less the likelihood of association with tuberculosis, and, the more improbable that the earlier symptoms have been due to disease subsequently diagnosed as tuberculosis. One must be governed by the authenticated history and the extent of the lesion described.

Summary

From a careful review of the cases suffering from this symptom it appears to me that:

1.—Tuberculosis among D.A.H. pensioners is not unduly common, nor in undue proportion to other common conditions.

2.—An entry of D.A.H. in the documents, in association with, or not associated with shell shock, has no great significance.

3.—The finding of minimal lesions several years after a discovery of D.A.H. is not a sufficient explanation of the effort syndrome, nor does it justify the conclusion that the original diagnosis was in error.

4.—The more remote the D.A.H., the less likely the association.

5.—That long years of relatively impaired health with consequent financial worry, etc., may activate tuberculosis is an open question. The importance of this fact is highly conjectural, but the development of tuberculosis under such conditions can scarcely be considered consequential in the administration of pensions.

The mortality from malaria in Italy, which was 0.72 per 1,000 inhabitants in 1887, fell to 0.66 in 1914, and, although the war caused an increased incidence of malaria in Italy as in other countries, the mortality was only 0.1 per 1,000 inhabitants in 1920.

A PRELIMINARY REPORT UPON THE CLINICAL AND EXPERIMENTAL USE OF DREYER'S TUBERCULO-ANTIGEN*

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ALTHOUGH Dreyer[1] stated with regard to his defatted antigens that "it seemed, therefore, legitimate to hope that they would prove of value as antigens for the treatment of diseases such as tuberculosis" etc., public and professional interest was aroused. This was undoubtedly due not only to the experimental work of Dreyer but as well to the favourable, although preliminary opinion reported by Drs. Fildes and Western regarding the tuberculo-antigen in the treatment of both pulmonary and non-pulmonary forms of tuberculosis.

The data which it was possible to gather for this meeting can not be regarded as satisfactorily conclusive, and in consequence this report must be regarded as a preliminary one. The antigen has been tried in three directions: namely experimentally with guinea pigs, as an antigen in the routine serial testing of tuberculous sera for complement fixation, and therapeutically with both pulmonary and non-pulmonary forms of tuberculosis.

It was prepared by following the directions published by Dreyer and for therapeutic purposes distributed free, chiefly to physicians in charge of sanatoria, chest clinics, or genito-urinary clinics (non-pulmonary cases). To all a definite questionnaire was given in which, under 13 main headings, information was requested which if answered would present a comprehensive classification of the case and a record of the clinical progress both preceding and following the use of the antigen.

The antigen was put up in four serial dilutions of the stock suspension (strength 1.0 cc. containing 1-5 mg.)

In the absence of any specific directions[2] by Dreyer or his colleagues regarding dosage, one had very little of definiteness to depend upon. The main features of the directions for dosage supplied by us suggested that an initial dose of 0.1 cc. to 0.25 cc. of the 4th dilution would be safe, and that not more than 0.25 cc. of the 3rd dilution should be attempted. The importance of slow and gradual increase was stressed. As most of the physicians to whom the preparation was supplied were experienced in giving tuberculin it was pointed out that overdosage would not necessarily show up as a tuberculin reaction and consequently this guide could not be expected or relied upon as possibly they were accustomed to do with other tuberculins.

Over 100 sets have been distributed to over 30 physicians, chiefly through the agency of the Department of Soldiers' Civil Re-Establishment and the Canadian Tuberculosis Association, not including the use of this by my colleagues and myself in both clinic and private practice.

From the reports received for this meeting the majority feel that their cases have not been on treatment for a sufficient period for them to form any definite opinion. Thirteen physicians, however, reported on 155 cases in considerable if not full detail; two on 60 cases giving only their opinion which was not favourable up to the present. The 155 cases of pulmonary tuberculosis by x-ray determination included 81 cases 'far advanced', 53 'moderately advanced', 11 'minimal' and 10 so called 'peribronchial'. Of the last class 3 were, however, sputum positive. The final opinions as given did not seem to warrant at this stage further classification of these cases beyond stating that they included examples of long and short duration of the disease on all types and degrees of rest or exercise. There was as well sufficient variation before treatment in prognosis, symptoms, signs and complications to form a very comprehensive group.

The opinions expressed regarding the value of the preparations were indefinite although no one was enthusiastic over its value. There were odd cases in which the progress had been favourable, —in one remarkably so: many cases had retrogressed as promised by the initial prognosis. In none, or few, was the result regarded as necessarily due to the use of the antigen if one excepts the opinion of the two physicians on the group of 60 cases.

*Read at the D.S.C.R. Conference of Medical Superintendents, Ottawa, April 1924.

The dosage and rate of increase, as was to be expected, varied considerably. Dividing the reports of those who increased slowly and not beyond the two weaker dilutions, and those who apparently advanced more rapidly and used one or both of the stronger dilutions, there was no outstanding difference observed. In other words, any unfavourable results did not seem attributable to overdosage. Reactions both general and local were reported with all dilutions, although they were not frequent. Several reactions were followed by augmented sensitiveness to further increase. It should be stressed that the majority felt that the period of observation had been too short. Ninety-seven cases in which rather complete details were given showed an average of 3½ months under treatment; in certain of these the treatment had been discontinued; in the majority it was being continued. The longest time of treatment noted for any one case was 7½ months.

The experimental results are depicted in Tables 1, 2, 3, 4 and 5, which last is a composite graph based on the averages obtained from the first four. The following additional remarks are needed for their interpretation. All four groups of guinea pigs, those labelled 'controls', 'therapeutic', 'prophylactic and therapeutic' and 'immunized' were injected subcutaneously on August 1st 1923, with equal amounts of freshly prepared emulsion of tubercle bacilli which was practically free from any clumping. The group 'prophylactic and therapeutic' were repeatedly injected for some weeks previously with Dreyer's to offset any overdosage effect that this strength of antigen might exert when employed therapeutically only, as was done with the group labelled 'therapeutic'. In both these groups, 'therapeutic', and 'prophylactic and therapeutic' each animal was injected with 0.5 cc. of Dreyer's 'stock suspension' at approximately weekly intervals.

It was possible to use the group labelled 'immunized' because of some experiments we have been carrying on for several years on the problem of infection and re-infection. These experiments had already given us precise information regarding the low virulence of strain L. 172 and the average or possibly higher than average virulence of strain 'Davis'. From these experiments three guinea pigs which had been inoculated with strain L. 172 were taken with the idea of contrasting the immunity which was known would follow with that effected by the tuberculo-antigen as exhibited in the two other groups.

As shown in the Tables the progress of the disease is depicted by giving (1) the initial weight, (2) the highest weight obtained following the

TABLE I.—CONTROLS

Inoculated with 100,000 B. t. strain 'Davis' 1-8-23

G. P.	*Weight*	*Maximum weight*	*in weeks*	*Death weight*	*in weeks*	*Remarks*
164	285	380	7	260	9	General Tuberculosis
169	265	376	7	276	12	" "
172	295	456	7	324	15	" "
173	255	280	2	172	6	" "
Average	275	373	6.2	258	10.5	

TABLE II.—THERAPEUTIC

Inoculated with 100,000 B. t. strain 'Davis' 1-8-23
Injection (weekly 0.5 cc.) Dreyer's Antigen

G. P.	*Weight*	*Maximum weight*	*in weeks*	*Death weight*	*in weeks*	*Remarks*
165	265	390	7	284	14	General Tuberculosis
166	260	328	3	212	7	" "
167	275	424	9	290	13	" "
168	265	324	7	220	11	" "
170	295	380	8	276	12	" "
171	285	300	3	300	300	" "
Average	274	357	6.01	263	10.0	

XUM

TABLE III.—PROPHYLACTIC AND THERAPEUTIC

Inoculated with 100,000 B. t. strain 'Davis' 1-8-23
Injection (weekly 0.5 cc.) Dreyer's Antigen

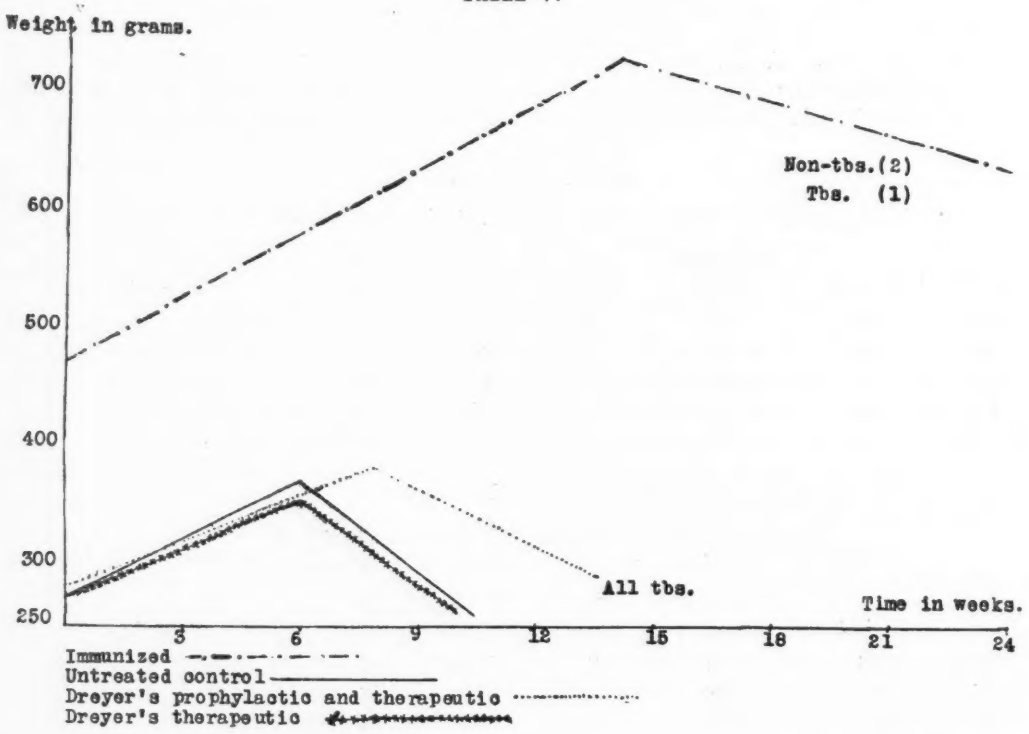
G. P.	Weight	Maximum weight	in weeks	Death weight	in weeks	Remarks
161	245	270	7	212	10	General Tuberculosis
160	320	540	8	422	24	" "
159	270	365	7	260	9	" "
157	290	370	10	290	12	" "
Average	281	386	8.0	296	13.7	

TABLE IV.—IMMUNIZED

5.25 Million B. t. strain L. 172 on 26-5-23:
100,000 B. t. strain 'Davis' on 1-8-23

G. P.	Weight	Maximum weight	in weeks	Death weight	in weeks	Remarks
152	460	732	14	630	23	No tubercle
154	360	608	14	566	25	" "
148	615	832	14	800	25	General chronic tuberculosis
Average	472	724	14	665	24.3	

TABLE V.



inoculation and the duration in weeks that this represented, and (3) the weight and duration of life in weeks when death took place.

An average was struck from each group and this is depicted as a graph in Table 5. All animals were allowed to die and autopsies

performed on them. A non-tuberculous infection was the cause of death in the pen of the 'immunized' group, on whom weekly weighings had been given up after the 14th week. In the post-mortems conducted no gross tuberculosis was found in two of the three immunized guinea pigs. In all others the post-mortem showed generalized tuberculosis.

An analysis of the first three tables shows the considerable variation between individual guinea pigs in each group that is to be expected with experimental tuberculosis in these animals. The difference for the first three groups shown in table 5 by taking an average as representative of each group is for practical purposes approximately equal to the individual differences obtained in each separate group. The true immunization achieved by the inoculation of an avirulent strain is effectively shown in table 4 by the fact that two pigs failed to show any gross tuberculosis while the third showed chronic general tuberculosis, so labelled because of small pulmonary cavities.

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(2) Subsequent to the distribution it was learnt that the Medical Research Council was distributing two dilutions, one containing 1-100,000 mg. and one 1-20,000 mg. per cc.

COMPLICATIONS MET IN SANATORIUM PRACTICE*

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THE cases reviewed in this paper are the first 621 admitted to Central Alberta Sanatorium. The complications dealt with are grouped by systems. Of these patients about 70% were far advanced ones.

Respiratory System.—Laryngeal tuberculosis has been most frequently met with. It has been diagnosed in one hundred cases, *i.e.*, about one-sixth of the total number of cases, of which total one-tenth were discharged as non-tuberculous. This evidently is too low, and is much lower than is shown by patients now being treated. The last review showed over 32% with laryngeal tuberculosis.

While the number is large, not all affect seriously the general prognosis. Walsh[1] in reviewing 120 autopsies of tuberculous patients, found tuberculosis of the larynx as the cause of death in 3.3%. Of our cases there were twenty-three in whom the laryngitis was a serious factor in the course of the disease. These severe laryngeal cases were associated with rapidly progressing ulcerative types of lung disease. As has been stated previously, the course of the laryngitis follows closely that of the pulmonary disease. There are the cases which yield readily to treatment, there are the chronic lesions with periods of exacerbation and remission, and there are the very acute ones, characterized by ulceration and destruction, where no control is possible.

The prognosis to be given depends upon the recognition of the presence of laryngeal disease, and the extent and type of lesion, whether ulcerative or fibrous; as well as on the general systemic condition. Laryngeal complications are continually developing, and to discover these routine examinations at frequent intervals are necessary if proper treatment is to be instituted before the condition becomes serious. Certain symptoms, as hoarseness, dryness and soreness, suggest laryngeal involvement, but they may be complained of by patients and yet no demonstrable lesion be discoverable. Laryngeal involvement may exist with no complaint from the patient. Table I shows the symptoms complained of in reference to laryngeal diagnosis in the 125 patients.

It is not my intention to discuss the various methods of treatment. However, the acute and sub-acute larynges require definite care, while the chronic ones may be quite free from symptoms, and, except at periods of exacerbation, need little or no attention.

*Read at the D.S.C.R. Conference of Sanitorium Superintendents, Ottawa, April 1925.

XUM

TABLE I

Frequency of Laryngeal Symptoms in 125 patients:

	Tuberculous	*Suspected*	*Negative*
Hoarseness	26	8	19
Fullness	2	1	1
Dryness	14	8	14
Soreness	11	3	24
No Complaint	8	6	21

Repeated examinations will help to clear up doubtful diagnoses.

Pleurisy with effusion, non-purulent.—This has been comparatively an infrequent complication under sanatorium treatment. We have found it twice in minimal cases, six times in moderately advanced cases, and only twice in far advanced cases. Histories taken, however, would indicate that pleurisy with effusion is more common before admission to sanatorium than after. After the appearance of gross lung tuberculosis of chronic nature, pleurisy with simple effusion is infrequent in my experience. These effusions are, I believe, better left alone, unless urgent embarrassment occurs from mechanical causes. Effusions have been frequent in artificial pneumothorax cases. At some time or other, and to varying degrees, 54% of our cases have shown non-purulent fluid. This has produced no injurious effects, except in one case where the effusion became purulent. It was treated by repeated aspirations and instillations of formalin and glycerine, gentian violet, and methylene blue. No control was gained over the pus formation and eventually permanent drainage was given by rib resection. The patient continued with this discharging sinus until he died suddenly from profuse haemorrhage.

Pyo-pneumothorax has been met four times. In six other cases empyema has been diagnosed but no evidence of a pneumothorax found, although it is possible at the start such a condition was present. Three empyemata were considered non-tuberculous, and were drained by rib resection, and left the institution apparently cured. Two cases of pyo-pneumothorax, one mentioned above, were treated by repeated aspirations of pus and instillation of formalin in glycerine; this was discontinued and daily irrigations were kept up with gentian violet, and later by methylene blue. This was unsatisfactory, no control over the pus was gained, and one patient died of haemorrhage and the other from meningitis. Tuberculous empyema, whether alone or complicated by a pneumothorax, is a very serious complication, and in only one case has any degree of health been attained. This patient has a bronchial fistula which daily functions.

Chronic pleurisy without effusion may cause pain which is very troublesome owing to its persistence. It is present at times in nearly every case, but in some instances is a very distressing condition. Counter-irritation will temporarily give relief, but the natural remedy lies in the limitation of chest movements. This can be produced in various ways. We have used plaster bandages in some cases satisfactorily, but in others a many-tailed bandage, tightened two or three times a day, gave more relief. A similar bandage gives good relief to patients whose cough is severe and racking. Such restraint, with its resultant comfort, appears to be a definite factor in reducing temperature. At times the improvement following such chest restriction is striking.

Digestive System.—Gastro-intestinal complications are probably the most frequent of all, and have a definite effect on prognosis and treatment. Landis[2] reported that of 3007 cases seen at Phipps Institute, 1587 or 53.3% had gastric symptoms. The loss of appetite for shorter or longer periods, the distress and gas after meals, the constipation and occasional diarrhoea, so frequently occur and arise from such varied causes that they are met with daily. If among these cases, tuberculosis of the bowel is to be discovered before the diagnosis is apparent to all, every patient must receive routinely thorough gastro-intestinal tract examination at stated intervals; for practically every patient has at times evidence of digestive disturbance. Stewart[3] reported on 562 patients that 18% were diagnosed as having intestinal tuberculosis, and 37% were suspected of intestinal tuberculosis. We have examined 95 cases in whom a barium meal was given, 91 of whom had symptoms referred to the digestive system. Our findings were as follows:

TABLE II

Diagnosis on 95 cases examined for Intestinal Tuberculosis.

Definite	*Suspected*	*Negative*
21—22%	17—18%	57—60%

It is evident that a large number of sanatorium patients have clinical symptoms and evidence of definite intestinal tuberculosis. One of our patients showed filling defects by x-ray fifteen months before symptoms referable to the gastro-intestinal tract were complained of, although at the time of monthly examinations direct questions were asked regarding appetite, digestion, and bowel movements. Unfortunately the patient was not given another barium meal, but

symptoms suggestive of severe intestinal tuberculosis developed and death followed. In this case x-ray examination showed defects in the region of the cæcum long before any localizing symptoms appeared. Various writers claim symptoms referable to the abdomen are the late ones, and that for early ones we must look to nervousness, failure to gain weight, and loss of appetite. If this be so, I feel that routine gastro-intestinal tract examinations must occupy the same place in sanatorium routine as chest and laryngeal examinations. An analysis of the symptoms referred to the gastro-intestinal tract shows that their occurrence justifies further examination, but no diagnosis can be made on symptoms alone.

TABLE III

Symptoms referred to the gastro-intestinal tract in diagnosing.

	Tuberculosis	*Suspected*	*Negative*
Diarrhoea	15	7	6
Abdominal Pain	18	7	12
Gas	7	8	26
Constipation	1	3	11
Anorexia	3	7	16
No Complaint	1	1	6

Abdominal pain and diarrhoea seem most reliable as symptoms of advanced disease, although Walsh reported on 100 autopsies of tuberculous patients that 54 showed ulceration, and of these 21 had diarrhoea; while 46 showed no ulceration and of these 18 had diarrhoea. Post-mortem findings show that the terminal cases have intestinal tuberculosis in at least 75% of cases. Walsh[4] has given intestinal tuberculosis as the direct cause of death in 2.5% of 120 autopsies.

The course followed by the advanced intestinal case is so closely associated with the terminal lung condition that palliative treatment seems alone indicated. When the intestinal condition is associated with much emaciation, we have been unable to check the progress of the disease; on the other hand moderately severe abdominal symptoms may subside, and the patient's general condition may improve provided the general nourishment of the body remains good. In selected cases, surgical procedures have given satisfactory results in the hands of others. The length of time is too short, and our knowledge of heliotherapy too limited to make great claims for its benefits, but results are at least very encouraging. We have at present six patients, who a year or more ago were diagnosed as definite well advanced cases with pain and diarrhoea, who under light treatment by mercury quartz lamp, augmented by sunlight, have improved so that they are practically free from symptoms, and their x-ray examinations show fewer abnormalities. The patients also received cod liver oil and calcium lactate by mouth. There is reason to hope that where diagnosis is made early, considerable benefit will result from heliotherapy with routine care supplemented by the x-ray in selected cases.

Non-tuberculous conditions of the gastro-intestinal tract occur in probably the same proportion as in the general population. Duodenal ulcer, cholecystitis, and appendicitis are encountered from time to time, and I believe that surgical relief should not be withheld unless the general condition of the patient absolutely forbids it. When the patients with actual pathological lesions of the gastro-intestinal tract have been eliminated, there still remains a large group with symptoms of digestive disturbance of indefinite origin. These require a very nice adjustment of their mental and physical conditions to diet and every one is a problem requiring individual attention.

Genito-Urinary System.—Tuberculosis of the kidneys has been recognized eleven times, or in 1.7% of cases. It is quite apparent if consideration be given to autopsy reports, that renal tuberculosis in our hands very often has been undiagnosed. Hobbs[5] found in the post-mortem records of 1000 cases that 16.2% showed tuberculosis of the kidneys on macroscopical examination. Other post-mortem findings vary from 8% to as high as 53.8% as reported by Walsh. The percentage found will vary with the care used in examination. Lawrason Brown and Bernstein, reported by Hobbs[6], in two independent series of cases of pulmonary tuberculosis with no symptoms referable to the genito-urinary system found tubercle bacilli in the urines in about 10% of cases. Hobbs, himself, in 100 cases found tubercle bacilli in six cases, three times in far advanced lung cases, and three times in moderately advanced. To get such results, guinea pig inoculation is essential. If, then, from six to ten per cent. or more of our cases have tubercle bacilli in the urine, which in the majority of cases will mean renal tuberculosis, should guinea pig inoculation be done on all urines in order to make this diagnosis? What effect on prognosis has this diagnosis in the absence of symptoms? What treatment is indicated?

Judging from the rareness with which genito-urinary symptoms have been met in advanced and terminal cases, it is questionable what effect

the renal condition has on the general prognosis, and whether any treatment be indicated in the absence of local symptoms. Routine urine examinations have shown that in 27 cases, or 4%, albumen, casts, hyaline and granular, were repeatedly present, and a diagnosis of nephritis has been made. This condition is usually a terminal one, associated with fever and general wasting rather than with any definite tuberculous renal lesion. In addition to the tuberculous kidneys and nephritic cases, urine with albumen or red blood cells or hyaline casts on more than one occasion has occurred in 170 patients, *i.e.*, 27% of admissions. These have been about equally divided between males and females.

TABLE IV

Frequency of albumin, red blood cells, and hyaline casts in cases not diagnosed as renal tuberculosis or nephritis.

Albumen	*Red Blood Cells*	*Hyaline Casts*
105—16.91%	21—3.38%	60—9.66%

All told, the abnormal urines considered pathological have been found in 33% of our cases.

What significance is to be attached to abnormal urine findings other than the presence of tubercle bacilli? Fishberg[7] states that "in phthisis, albuminuria is not necessarily a manifestation of nephritis or even of renal tuberculous lesions." While this is so, it is equally true that a trace of albumen may be the first and only sign of tuberculosis of the kidney. With the appearance of scattered red blood cells and pus, the probability of the presence of a tuberculosis of the kidney is greater. There are apparently diverse opinions regarding the relationship of albumen and granular and hyaline casts to nephritis in tuberculosis. Fishberg relates Montgomery's opinion that in pulmonary tuberculosis albumen and casts are not often associated with evidences of nephritis. Other writers evidently consider the presence of albumen and casts as laboratory evidence of nephritic kidneys. For want of a better classification, I have considered albumen and granular casts as evidence of nephritis of toxic origin.

As time goes on and more research has been done, we may hope to understand to a greater extent the nature of urinary changes in interpreting kidneys. It does seem now, that these abnormalities are a sign of systemic derangement rather than of specific renal changes. Their appearance or increase in a patient apparently progressing favourably will surely lead to a guarded prognosis. The surgical kidney with symptoms referred to the urinary tract in our cases, has not been associated with any definite active pulmonary disease. Two cases have had indefinite chest pains, interpreted as pleuritic, and one case had on x-ray examination a few apparently healed, discrete apical lesions.

As regards treatment, since the great majority of cases merely reflect a general systemic infection, it is very doubtful if any but routine hygienic care is indicated. For the properly selected tuberculous kidney with symptoms, surgery is, I believe, indicated. Tuberculous epididymitis has been diagnosed in 2% of male patients. No diagnosis of genital tuberculosis has been made in the female patients.

Osseous System.—Tuberculosis of bones has been diagnosed nineteen times, or in 3% of admissions. The various locations are as follows: Spine 8; Hip 4; Knee 3; Ankle 2; Elbow 2.

Nervous System.—Tuberculous meningitis, as a terminal complication, occurred six times, or in 1% of cases.

Lymphatic System.—We had one case of generalized tuberculous adenopathy associated with advanced pulmonary tuberculosis.

Female, admitted Nov. 19, 1923; Scandinavian age 40, married, contact with tuberculosis at 13 years of age.

Present Illness: Loss of weight for one year, spring of 1923 noticed enlarged glands on right side of neck, later on the left, in axillae, and groins. In Aug. 1923, cough began.

Examination: 24 lbs. under normal weight; chest had signs and x-ray evidence of advanced pulmonary tuberculosis; sputum positive; enlarged glands, matted, protruding, about the angle of jaw; masses size of small hen's egg and smaller ones in both axillae; visible inguinal glands size of an olive; infraclavicular glands; and indefinite masses in the epigastrium and lower abdomen. No fluctuation noted anywhere. Temperature irregular, 99 to 101 degrees, pulse 88 to 120. Patient had frequent vomiting of food and complained of sensation of fulness in epigastrium after eating a small amount. Jan. 13th, 1924, unable to void urine; developed flaccid paralysis of both legs from hips down; mentality dull and gradually became more stupid, not comatose; discharged Jan. 15th, 1924, and died a day or two later. Pathologists report on axillary gland removed Dec. 5th, 1923; caseation; giant-celled formations; disintegration of lymphoid cells; little fibrosis; no eosinophilia. Pathological diagnosis: Tuberculosis.

This brief review of our study has convinced us more and more of the necessity of intensive individual study, if tuberculous complications are to be recognized before the advanced stages are reached when treatment is so much less satisfactory.

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THE NEURASTHENIC REACTION*

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THE subject indicated in your programme for this paper may be somewhat misleading. I have chosen to discuss the psychoneurotic reactions with particular reference to the symptom complex called neurasthenia, in deference to the fact that this is the diagnosis attached to probably well over sixty per cent. of the psychoneuroses which have been reported among the members and ex-members of the Canadian Expeditionary Force. Of the neuroses and psychoneuroses reported in connection with ex-members of the Canadian Expeditionary Force who have also been treated for tuberculosis, the psychoneurotic manifestations have been described as neurasthenia in over eighty per cent. of the cases.

Since 1914 there have been reported from the Canadian Expeditionary Force approximately fourteen thousand neuropsychiatric cases. Sixty-six hundred belong to the group known as the psychoneuroses. If my first estimate has been correct approximately four thousand of these cases have been reported as cases of neurasthenia. This suggests very definitely either that this entity is one that deserves very special consideration, or that an enormous number of reactions have probably been incorrectly placed in this category.

Before we proceed to a discussion of what is included under this diagnostic term, I would like briefly to indicate something of the purpose of this paper. I shall propound one or two specific questions which I would like this Conference to answer. I have some suggestions to make for your criticism. To make clear how these questions have arisen, may I read you extracts from two cases:

1.—N. M.; age 32. Discharged from the army July 1918 while in sanatorium undergoing treatment for active tuberculosis. At intervals during 1919, 1920 and 1921 he has undergone treatment for the pulmonary disability. Reports on his file indicate that in October 1922 and for some time previous to that date he had not been in need of treatment for the pulmonary condition. The last pension examination dated January 1920 would indicate that there has been no change whatever in the pulmonary condition from October 1922 to January 1924.

In 1923, five years after demobilization, he starts to work for the first time since discharge, but is forced to give up on account of a symptom-complex including nervousness, weakness, shortness of breath, choking sensations, smothering attacks, tremors. The neurologist in the unit continues as follows: "The actual organic condition is now replaced by an active fatigue neurosis due either to toxic factors or to prolonged unoccupation with mental and physical inertia, or both."

He asks the question: "Is treatment admissible for this new condition which is essentially and primarily dependent upon the original disabling factor?"

2.—L. E.; age 27. Review of this man's record indicates that he suffered from a condition diagnosed as shell shock (in the same entry called neurasthenia) in 1916. He was discharged in October 1919 and given a gratuity of $25 for what was considered a slight neuropsychiatric disability. He was treated in Winnipeg from September to December 1920 for a definite psychoneurosis and at the termination of the hospital period was granted a gratuity of $300. In April 1923 he was re-admitted to hospital. On investigation his disabilities were described as neurasthenia and tuberculosis. A very short time prior to his admission to hospital he had apparently had pleurisy with moderate effusion. On reviewing this case the Eligibility Board in the unit state:

"The Eligibility Board are of the opinion, considering the continuous history of debility since discharge and since there is no report of any special examination of the chest on file, that he was really suffering from pulmonary tuberculosis at the time he was being treated for a neuropsychiatric condition."

They go on to say: "This is a common mistake, as it is well known that the diagnosis of neurasthenia has frequently been changed to pulmonary tuberculosis after more careful examination. We are, therefore, of the opinion that the pulmonary tuberculosis now present was contracted or manifested itself on service."

These represent two type cases. Similar cases

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are being reported from week to week. The questions then arise:

1.—Is a psychoneurosis making its appearance in a patient who has been under treatment for pulmonary tuberculosis directly related to the original disabling factor?

2.—Is the psychoneurosis related specifically to the treatment period?

3.—Is tuberculosis arising in a patient who has been in receipt of treatment for a condition diagnosed as a psychoneurosis to be regarded as in any way related to the mental condition?

4.—Is it possible to clinically differentiate between the psychoneurosis frequently called neurasthenia and pulmonary tuberculosis?

In order to have a common ground upon which we may deal with this question it would appear necessary that we have a mutual understanding as to what neurasthenia is.

Neurasthenia is known by its constant manifestation as a fatigue neurosis. Effort, physical or mental, is accompanied by an extraordinary subjective fatigue reaction. The individual is incapable of sustained effort. There may also be symptoms referable to the digestive, circulatory, respiratory, or other systems such as discomfort after taking food, palpitation, precordial pain, shortness of breath, dizziness, tight feeling in the head, etc. The patient may confine his complaints pretty much to one system or they may be enormously varied and he may present a very definite hypochondriacal trend. It is most unusual to find a pure fatigue reaction without the additional hypochondriacal trend referred to above being present in some degree. This then is very briefly how neurasthenia manifests itself. Now the question arises: What is it? Does it always or frequently occur in individuals who through some constitutional lack have throughout life been incapable of prolonged effort; or is it the external manifestation of an unhealthy mental reaction, an inadequate attempt to meet an environmental situation?

The reader who is attempting to answer these questions may in the end be somewhat at a loss to know just what is the truth. The reason for this is not that the question is a particularly difficult one to answer, but because having satisfied himself that he knows what neurasthenia is, he approaches this group of cases only to find there a veritable scrap-heap made up of a variety of pathological types which do not agree with his recently acquired conception.

To answer the first question, does this condition always occur in individuals who have an inherent physical defect? There is undoubtedly the type of man who throughout his life very definitely lacks resistance; who experiences unusual fatigue on moderate exertion; whose credit balance is readily dissipated. This type, however, constitutes a very small group, and does not present a serious problem. The neurological advisor to the Board of Pension Commissioners tells me that there are at the present time approximately eight hundred cases in receipt of pension for conditions diagnosed neurasthenia. Probably under twenty will fall into the group discussed above. When such an individual has overstepped the safety line rest is essential to restore his normal balance.

To answer the second question: does the neurasthenic reaction, so-called, signify primarily an unhappy or inadequate psychological reaction? Is this fatigue syndrome, accompanied as it may be, the result of a mental attitude? When we speak of psychological force we do not know exactly what it is that we are talking about. We do not know what electricity is, but we have in some degree solved the problem of dealing with and directing this form of energy. In the same way we know that psychological force is a constant accompaniment of biological activities. We know something of how this force may be used, of the effects to be obtained by its useful direction and wise modification.

We are as individuals variously constituted physically and psychologically according to our inheritance. We cannot deny the importance of this transference of qualities. We are modified physically by the sort of soil in which we grow, the stresses to which we have been submitted. We are modified similarly from a psychological standpoint by every experience and contact. Depending on our mental equipment we meet our various situations of everyday life easily and with poise, or uneasily and with upsetting effects. The failure to make a correct and complete accommodation in the face of any situation always results in a psychological disturbance. The disturbance may be so slight as to pass unnoticed except to ourselves, and we very seldom know ourselves sufficiently well to recognize the cause or the significance of the emotional upset. The latter may be so pronounced as to more or less destroy completely our efficiency and be manifest to others in the form of a psychoneurosis. I am of the opinion that the very large group who, perhaps with some justification, are described as

neurasthenics, fall under this class, that is that their psychoneuroses result directly from an inadequate attempt to satisfactorily adjust themselves to a present situation.

From this aspect neurasthenia may, and I think that the particular type of case we are here dealing with does, very frequently represent simply a psychological letting-down in the face of a difficult or unwelcome situation. We as individuals usually tend to accept the path of least resistance. We resent change. The man who is in a comparatively comfortable assured position finds himself in a state of perplexity and indecision when he considers the change of something that is assured for something that is uncertain. Your patients have probably accommodated themselves very comfortably to the hospital routine; they have become quite accustomed to consider themselves in a special group and deserving of special consideration. If the patients happen to be ex-members of the Canadian Expeditionary Force, their tuberculosis having been related to their service period, they and their dependents are adequately provided for as long as they need treatment. It is not to be wondered at under these circumstances that there should be a definite letting-down with the development of typical psychoneuroses at the thought of again resuming domestic, social and economic responsibilities.

I would like to suggest that every long treatment case deserves a personality study; his reactions during treatment should be carefully observed and recorded; some regular form should be employed in order that these observations may be systematically carried out. The patient should be observed in his various relationships, for instance, with reference to,—(1) his attitude towards his disease, (2) his hospital contacts, occupation, treatment, recreation, food, sleep, personal contacts, (3) his contacts with the outside, his home etc., (4) his attitude towards resumption of outside responsibilities.

If such a plan were followed unquestionably some of the definite psychoneurotic reactions would be avoided and a large number of patients would be rendered efficient who otherwise would make their various ways with more or less difficulty.

It would seem to me that where there are not unusual circumstances, the psychoneurotic reaction developing during sanatorium treatment for tuberculosis is definitely a part of the treatment problem which has been assumed by the sanatorium physician.

Arrested Development of the Colon.—Robert L. Rhodes, Angusta, Ga., reports three cases. In the first case, the caecum had been arrested at a point just above the level of the umbilicus; the appendix was retrocolic and adherent throughout except the proximal half inch; the tip was on a level with the costal margin, and had perforated with the development of an abscess, completely walled off by the ascending colon. The second case was one of arrested caecum and intussusception of the appendix, with partial intestinal obstruction. The third was a case of complete arrest of the colon, with intussusception of unusual extent. The intussusception consisted of 12 inches of ileum, the caecum and the rudimentary colon (entire) into the sigmoid, where necrosis and sloughing took place. These cases were discovered clinically.—*Jour. Am. Med. Ass.*, May 31, 1924.

Obesity and Blood Pressure.—Some writers say that the blood pressure in obesity is raised, others that it is not, and therefore Goffin (*Le Scalpel*, January 19th, 1924, p. 61) has analyzed the records of 250 people who came to him for insurance examination. Any diseased person was excluded, so that the influence of obesity *per se* might be determined. The ages were from 20 years upward, and the author classified his obese subjects according to degrees of obesity from a weight of 130 lb. with a height of 5 ft. 6 in. to 190 lb. and upwards. He finds that the blood pressure is increased in obese subjects, and believes that the explanation lies in the plethoric condition of corpulent patients and the hyperviscous state of their blood. Attention to diet and the reduction of obesity usually brings the pressure down.—*Brit. Med. Jour.*, June 7, 1924

Case Reports

REPORT OF A CASE OF ADDISON'S DISEASE TREATED WITH BENEFIT BY A SUPRARENAL TRANSPLANT

MORLEY CURRIE, B.A., M.D.

Picton

Mrs. E. J., aet. 50 years; married when 21 years old, and has two children living, aged 21 and 25 years; mother died of abdominal cancer at the age of 64; no family history of tuberculosis obtainable. Patient is 5 feet 3 inches tall, and has always been slight and delicate. When 18 years old she was practically invalided for seven weeks with what was called nervous indigestion. She had an attack of typhoid fever at the age of 21 years, and a year later underwent an operation for an ovarian dermoid cyst from which she made a good recovery. For the past 20 years she has suffered from attacks of indigestion relieved by an alkaline laxative before meals. In December, 1922, she suffered from what appeared to be one of her ordinary attacks of indigestion but improvement did not set in as usual; she became weak and nervous, had a blood pressure systolic 110, diastolic 80. She was confined to her bed this time for 2½ months during which she had to remain for the most part on a liquid diet. When allowed to get up she did not regain her usual strength. She was not seen again until the following August when she reported that she was very weak and had been having attacks of nausea and diarrhoea, which compelled her to remain in bed a good portion of the day owing to weakness. In the beginning of September she was seen by me and examined in bed . The skin under her abdominal belt was found to be pigmented deeply. The pigmentation extended in less degree upward on the chest and downward on the thighs. There was also slight pigmentation of the neck, face, elbows and one leg. There were numerous spots of intense, almost black, pigmentation resembling small holes on the front of the abdomen. The patient said that she had noticed these dark spots for several weeks. She was suffering at this time from pains in the back which were severe, and from neuralgic pains in the head. Her temperature was 98° F, pulse 98, blood pressure, systolic 90, diastolic 80. Her weight was 86 lbs. The patient was given dried suprarenal gland by mouth, and once a day by rectum.

During this month of September the attacks of diarrhoea and nausea continued; by the end of the month her diet consisted almost entirely of egg albumin and a prepared milk food. About this time she began to complain of attacks of faintness and smothering. The pains in the back and head were more severe. The patient was only able to sit up in a chair for part of a day. An attempt was made to give her hypodermically ½ c.c. of 1-1000 adrenalin. This was followed in a few minutes by numbness of the extremities, blanching of the surface and fainting; under active stimulation the patient improved in about half an hour. After this adrenalin was given by the mouth, but without any noticeable results.

The patient continued to grow weaker. Asthenia and cardiac weakness were marked. Slight exertion in bed caused breathlessness. By December 1st, the attacks of praecordial distress, faintness and breathlessness were so common that the sudden death of the patient would not have caused any surprise. Emaciation was very marked. Her weight could not be taken. On Dec. 4th, the day following an attach of nausea and diarrhoea the suprarenal gland of a sheep was transplanted into an abdominal incision going down to the deep fascia. The transplant was in position one hour from the time of the slaughter of the sheep. On Dec. 8th the patient expressed herself as feeling better. There was less faintness and praecordial distress. Her blood pressure was definitely raised, systolic 110, diastolic 80. On Dec. 11th she still expressed herself as feeling better. The stitches were removed. The skin had united, but redness and tenderness had developed on both sides of the incision. It appeared as if the transplant would not be a success. On Dec. 13th there was a discharge from one end of the incision; the patient suffered from

nausea, diarrhoea and cardiac distress; blood pressure had fallen, systolic 80, diastolic 70.

Nothwithstanding the failure of the transplant it seemed that there had been some slight improvement for a few days as the result of its presence. On Dec. 14th both suprarenals of a sheep were transplanted by the following technique; when the butcher opened the abdomen of the sheep suspended by its hind legs, the abdominal contents fell downwards exposing the kidneys; the fat above the kidney was seized with a pair of sterile forceps and the kidney and surrounding fat cut out with a pair of sterile scissors; the whole mass was at once dropped into a jar of warm, sterile, normal salt solution; this operation was repeated on the second kidney. The material was then taken to a warm room and the suprarenal glands together with some of the surrounding fat was dissected out without touching them with the fingers; this dissection was difficult. Each suprarenal was then held in forceps over a jar of warm sterile salt solution and the glands were cut in fine strips with a pair of sharp scissors; the pieces either fell into the salt solution or were washed off the scissors by dipping them in the solution. When both suprarenals had been treated in this way the resulting tissue was skimmed out of the salt solution with a sterile spoon and dropped into the barrel of a 10 c.c. diarsenol syringe. The plunger was then introduced and the excess of salt solution and air were expelled; the syringe was wrapped in a warm towel and taken to the patient. A little novocaine was injected into the prepared area on each side of her abdomen; a salvarsan needle was then fitted on the syringe containing the suprarenal tissue and a thin thread of tissue was forced out; the needle was then inserted deeply into the subcutaeous tissue on one side of the abdomen and about half the tissue was forced out as the needle was gradually withdrawn. After its withdrawal a fresh sterile needle was put on the syringe and the operation was repeated on the other side of the abdomen; altogether about 5 c.c. of gland and salt solution were injected; the punctures were sealed with collodion and the operation was completed about 1½ hours after the death of the sheep. On Dec. 18th the patient was sure that there was an improvement in her symptoms. She took some solid food without distress. Her blood pressure now was systolic 90, diastolic 75. By Jan. 9th the patient was sufficiently improved to sit out of bed for 20 minutes. She had no cardiac distress and the pains in the head and back were not so severe. Blood pressure had risen and was now systolic 95, diastolic 75. On Jan. 27th the patient was up in her room for 9 hours per day, walking about the house a little, sleeping well most of the time, the pains in the head were entirely gone. On March 6th the patient was able to do a little fancy work, and was out of bed all the day, occasionally making short walks on the street. She was eating a general diet, she had no cardiac distress, and had had no diarrhoea or vomiting since Dec. 13th. Her blood pressure had again risen systolic 100, diastolic 75. The deeply pigmented mole-like spots and the pigmentation in the scar of the first transplant were distinctly lighter in color. The transplant masses are of about the same size as at the time of injection; they are not tender and show no signs of breaking down.

Comment

This case is prematurely reported owing to the fact that the patient is now preparing to leave for the United States. Her history suggests the probability of a condition of hypoadrenalism extending back for a good many years. It would be unsafe at present to draw any definite conclusion from the history of one case, but the improvement which took place suggests some further work along the same or similar lines. As was noted in the description of the technique of the operation, considerable perirenal fat was no doubt injected with the adrenal substance. The persistence therefore of the injected masses at about their original site may not be a positive proof of the persistence of the suprarenal tissue. The low blood pressures given have been difficult to obtain accurately. When using the ausculatory method the sounds have sometimes been inaudible. At times the pulse could be felt after the systolic sound ceased by the stethoscope.

Since this transplant was done an opportunity has been afforded of reading the literature on the subject. No transplantation of

suprarenal tissue appears to have been done by the method described. "The available evidence indicates that suprarenal substitution by means of grafts is possible but difficult."[1] This quotation refers to experiments on animals. Four cases of transplantation in human beings are reported with death following in from one to three days.[2] Hurst[3] reports the transplantation of the suprarenal gland of a child which had died at birth into the testicle of an adult. The testicle atrophied but the graft remained. There was no marked change in the pigmentation of this patient but there was marked improvement in other ways.

REFERENCES

(1) *Endocrinology and Metabolism*, Vol. II, p. 119. (2) *Endocrinology and Metabolism*, Ibid., p. 305. (3) *Proc. Royal Soc.*, Vol. XV, No. 7, May.

BULLET WOUND OF ABDOMEN, LIVER AND LUNG; RECOVERY

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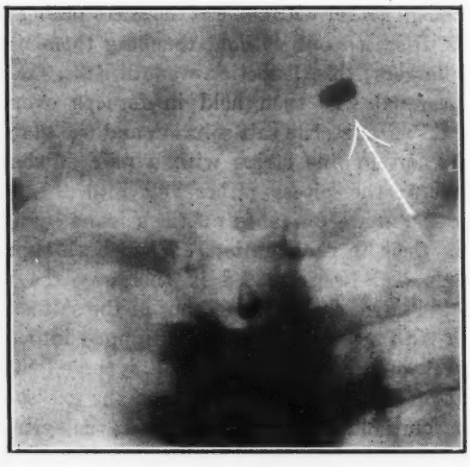
Lampman, Sask.

A healthy farm boy of fifteen years was carrying a .22 rifle on his right shoulder. The barrel pointing to rear. The gun, which was charged with a .22 short cartridge, fell to the front and discharged. The bullet entered the right abdomen, through the outer edge of the rectus muscle, seven centimeters below the costal cartilage. The boy was unaware of injury until he felt blood flowing on his skin. He walked a quarter mile to his house and was quickly transported six miles to the local hospital, where he arrived in good condition. Pulse 92, respiration 25—no pain or discomfort.

Ninety minutes after injury, I opened the abdomen under ether anaesthesia. I found a bleeding artery in the omentum and a furrow-like wound near the edge of the liver. No injury could be found in the bowel. A little blood recurring often, as it was wiped from the uninjured convex surface of the liver, showed that the diaphragm was perforated. The abdomen was closed and patient kept in moderate Fowler position, with ice to the right thorax. He recovered rapidly from the operation, leaving the hospital on the twelfth day.

After operation coarse râles could be heard over the entire lung, some dullness at the base, diminished expansion, no pain or discomfort. The dull area increased daily, evidently from serous exudate; there was little cough and slight bloody expectoration; temperature not above 100.4°, pulse not above 100. In the third week x-ray showed the right thorax full of fluid. The bullet just under the first rib, pointing toward the vertebra. Twenty ounces of blood-stained fluid were now aspirated from the thorax. The lungs expanded rapidly. Seven weeks after injury, the lung appeared normal, the patient was in excellent health and driving a six-horse outfit on his father's farm. He continues in excellent health and is working daily, nine weeks after injury.



It is evident from this case that a .22 short bullet may, at muzzle velocity, enter the abdomen, wound the omentum and liver, perforate the diaphragm and evidently pass from base to near the apex of the lung, without producing sensation of injury, and without succeeding shock or suffering. The history is certainly remarkable; within a week the lung is completely compressed by haemorrhage and serous exudate; two weeks later a portion of the exudate is removed, the rest is rapidly absorbed, and the lung apparently becomes normal. The patient was able to work daily and in apparently good health, seven weeks after injury. It is good surgery to not disturb the non-offending bullet.

A SMALLPOX EPIDEMIC*

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SINCE the publication of Jenner's classical work on the relation of cow-pox to smallpox, in the year 1798, and the gradual acceptance by large communities of the principle of vaccination, smallpox as a universal scourge has largely disappeared; so much so that an epidemic occurring in a population, a considerable percentage of the members of which have never been vaccinated, must occasion interest in the outcome, the more perhaps because of the interest being taken by the laity, and the attempt of some to undermine the original thesis. As the Medical Officer of Health of the border cities of Ontario remarked in relation to the recent epidemic there: "the value of vaccination as a means of prevention (of smallpox) has been proved as never before." (Bulletin 24A, Ont).

The following is an account of an epidemic in Ontario, in the unorganised districts of Algoma and Sudbury. This area is traversed by the main line of the C.P.R., scattered along which at intervals of many miles are numerous lumber camps. It also contains the railroad town of Chapleau, with 2,500 of a population. The original infection was carried by a lumberman who, travelling during the initial infectious stage of the disease through the various lumber camps, and landing eventually in quarantine at Chapleau, left in his trail several cases of smallpox.

All men in the lumber camps were immediately vaccinated, and no further trouble developed there. In Chapleau the epidemic continued for over a month before the vaccination Act was enforced, whereupon the outbreak subsided. School children were vaccinated at school, so that no child took the disease. Altogether there were in town nine cases, of which three died, all three being of a peculiarly virulent confluent and confluent-haemorrhagic type. The initial diagnosis, as in the case of the Windsor epidemic proceeding simultaneously, was difficult, the first case being diagnosed as scarlet fever. All the cases except two developed in unvaccinated persons, the two exceptions having a history of vaccination 18 and 35 years before respectively, the former having no vaccination scar. One patient claimed to have had smallpox 50 years ago, and had refused vaccination. All the severe types were in the unvaccinated. There were many contacts from these patients, but due to the fact that they had all been previously vaccinated, none of these turned ill, though often in the same room with the patient.

Outside of the town there were a further fifteen cases, all in the unvaccinated. There were three deaths at the Dalton Lumber Mills, where most of these cases occurred; this in addition to two still-births, deaths due indirectly to the disease, the mothers in both cases dying also. Many were opposed to vaccination at Dalton, and consequently the epidemic lingered on. On March 26th., one of the original cases was liberated after 44 days in quarantine, apparently non-infectious, and slept overnight, before entraining for the east, at the home of his sister-in-law, Mrs. E. In this household of five, only one boy had been vaccinated, (playing truant from home to return to school to be vaccinated with his chums), in addition to the father. On the eleventh of April, then, Armer E., unvaccinated, developed a high fever, and diagnosis of rheumatic fever was made. The next night a card-party was held at the house, at which eleven people were present, five unvaccinated, and six vaccinated. The following day the house was placed in quarantine for smallpox, and on the 14th compulsory vaccination was carried out in the Mills, every remaining person being vaccinated. On the 23rd., all the unvaccinated contacts from the card-party developed a high fever, with, as yet, no rash, and it was then that the history of the card-party was elicited. Thus, every one of the direct unvaccinated contacts developed the disease, whilst not one of those previously vaccinated took it, notwithstanding the fact that those previously unvaccinated had been vaccinated as a matter of routine on the 14th. All the patients were transferred to a temporary hospital, and of all the trained and untrained vaccinated nurses, and relatives in close contact in the homes, not one of the vaccinated succumbed.

Thus, of 24 cases of smallpox in the districts noted, all were unvaccinated save the two above-noted.

Conclusions reached from this epidemic were:

(1) Vaccination proved to be an absolute protective against smallpox in every case where a person had been successfully recently vaccinated before exposure.

(2) Vaccination, if performed after exposure to the disease, did not prevent the attack, but

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modified it to a large extent, except in the case of the pregnant women.

(3) There was no morbidity from vaccination; several persons expressed themselves as being in better health after than before vaccination.

The vaccine, which proved very efficacious, was supplied fresh from the Connaught Laboratories at Toronto. There were very few "unsuccessful vaccinations."

The head of the Lumber Company concerned, an ex-M.P., gave a good résumé of the above situation by his opinion: "We have right here," he said, "the most convincing conceivable proof of the inestimable value of vaccination."

Legal Aspects of Dichotomy.—By "A. Solicitor. "The practice of 'dichotomy,' or secret-fee-sharing, between a consultant and the general practitioner who has called him in, has medical aspects on which I am not competent to write. The practice has also legal aspects of a serious kind. Naturally the facts differ in each case, but we will suppose that a patient is attended by a general practitioner who advises an operation or consultation, that the patient accepts the advice and leaves it to the practitioner to arrange for the services of the operating surgeon or consultant... and that the (latter) on being paid his fee, hands a part of it over to the practitioner behind the patient's back. At once the following legal consequences result. If it be right to speak of the practitioner as having been the patient's agent (a point which will be returned to presently) the agent has taken a surreptitious profit in the course of his agency. An agent must not enter into any transaction in which he has a personal interest in conflict with his duty to his principal, unless the principal is fully informed and consents. If the patient is unaware of what is going on behind his back, he may, when he finds out the facts, insist that the practitioner (as his agent) shall account to him for the secret profit he has received. The agent must hand it over to the patient who otherwise can bring on an action for the return of the money." No plea could be made that such fee-sharing was a trade usage, for "the court would have to be convinced that the practice was reasonable and that it was not only common but general." Again, "The crux in the legal position is the question whether the practitioner acts as agent of the patient in obtaining the services of, and making the necessary arrangements with, the consultant. This is a question of fact. Agency may be inferred from the conduct of the parties. An agent is a person employed to bring the employer into legal relations with a third party. It is true that, in authorizing his doctor to obtain for him the services of a consultant, the patient is asking the doctor to do something for him gratuitously. But dichotomy puts an end to the gratuitous element in the transaction. Moreover, where the transaction is gratuitous, the only legal difference is that the parties may have no legal remedy if the transaction is not carried out at all.... Again, the patient may pay the consultant direct, but that fact does not negative the inference of agency." —*The Lancet*, March 29th, 1924.

A Cause of Pain in the Knee.—F. Sadolin (*Ugeskrift for Laeger*, March 20th, 1924, p. 240) describes a condition which, he says, is often mistaken for arthritis of the knee, although there are no signs indicative of a lesion of the joint. On walking the patient complains of pain referred to the back of the patella, and there is frequently a history of constant walking up and down stairs or walking upstairs with a heavy burden. In several of the author's cases the pain had gradually become so troublesome that work had to be given up, but rest, even rest in bed had not helped much. This condition, which may be unilateral or bilateral, forms a remarkably definite clinical picture which the author associates with a lesion of the median head of the gastrocnemius. He has found that if this median head is massaged for five minutes at a time every other day for about three weeks the symptoms disappear without any other treatment, even in cases which have been refractory to rest, baths, and massage of the joint and thigh.—*Brit. Med. Jour.*, May 24, 1924.

Retrospect

A REVIEW OF THE RECENT LITERATURE ON SUBACUTE BACTERIAL ENDOCARDITIS*

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Montreal

Historical.—The first unmistakable record of the clinical picture of the prolonged form of infectious endocarditis which Blumer was able to find, was an article entitled "On some of the principal effects resulting from the detachment of fibrinous deposits from the interior of the heart, and their mixture with the circulating blood" by W. Senhouse Kirkes in 1852. In 1868 Samuel Wilkes wrote an article on "Pyæmia as a result of endocarditis." In 1873 Lancheaux gave a clear and concise description of the outstanding signs and symptoms of subacute bacterial endocarditis. He associated it with malaria, doubtless because most of his patients were soldiers who had been in the tropics.

In 1885 Sir William Osler, in his Gulstonian Lectures, first adequately called attention to the disease in its varied forms. The peculiar skin lesions which have received the name of Os'er's Sign, were also noted between 1873 and 1900 by Rapin, Heubner and Munzer. In 1896 Samuel West described the first case of the type simulating splenic anæmia. This type was later noted by Parkes Weber (1910), Osler (1912), Riesman (1918) and Auerbach (1920).

In 1899 Mabel Austin described the first cases due to Bacillus Influenzæ.

Since the beginning of the present century, the most important contributions have been by Koeniger, Lohlein, Libman, Coombs, Gaskell, Bæhr and Clawson on the pathological side. Schottmuller, Rosenow, Horder, Major, Kinsella, Fox, Lynch and Clawson on the bacteriological and seriological aspects. Osler, Libman, Frank Billings, Vacquez and Kastner on the clin'cal viewpoints.

Terminology.—A survey of the literature shows that the course which an attack of subacute bacterial endocarditis may run, varies within wide limits. The disease may be fatal within a few days of onset, or a patient may survive two and a half years in exceptional cases. In most cases the disease seems to terminate in a period measured by months. The cases chosen by Blumer were on a three months minimum time basis.

An exact agreement as to just what is meant by subacute bacterial endocarditis has not been reached. Libman has included such conditions as are frequently called chronic ulcerative endocarditis, chronic malignant endocarditis and endocarditis lenta. He does not consider valvular defects resulting from rheumatic and syphilitic infections as being of the subacute type. He classifies endocarditis as rheumatic, syphilitic and bacterial. He subdivides the bacterial into acute (lasting up to about six weeks) and subacute (lasting from four to eighteen months or more).

Horder eliminates from the subacute bacterial class such conditions as acute bacterial endocarditis, bacterial endocarditis associated with other diseases, acute or chronic, and ulcerative endocarditis. Blumer classifies all protracted cases as "subacute."

Some of the different names that have been given to the condition are as follows:

(1) Chronic septic endocarditis (Heubner).
(2) Malignant rheumatic endocarditis (Litten).
(3) Rheumatoid form of septic endocarditis (Litten).
(4) Chronic streptococcus endocarditis (Horder).
(5) Chronic malignant endocarditis (Weber).
(6) Endocarditis Lenta (Schottmuller).
(7) Subacute infective endocarditis (Libman).
(8) Chronic ulcerative endocarditis (Riesman).

The term "malignant" was objected to because it throws no light on either its pathology or etiology.

"Septic" was objected to because there was no pus formation.

"Ulcerative" is open to objection because the lesions are much more frequently proliferative than destructive.

"Infectious" because it is too vague and would include rheumatic and syphilitic.

Prevalence and Importance.—Blumer states that unfortunately there are few accurate figures covering the frequency of subacute bacterial

*Taken from the articles by George Blumer, "*Medicine,*" May, 1923, and B. J. Clawson, "*Archives of Internal Medicine,*" February, 1924.

Read at a meeting of the McGill Reporting Society

endocarditis as compared with the three other common infections types, rheumatic, syphilitic and acute bacterial.

Lenhartz says that 42% of cases of infectious endocarditis are of this type. Horder says only 12%. Blumer thinks that Sir William Osler, while realizing the importance of the condition was perhaps not sufficiently impressed by its frequency.

In 1918 Libman stated that he had seen nearly 300 cases personally. Cotton states that 8% of invalided soldiers with gross valvular disease had subacute bacterial endocarditis.

There is some evidence which suggests that the disease is not equally prevalent in all parts of the civilized world. Stinert (1910) says that the subacute form is not the most frequent form in Liepzig. Gouget (1913) states that "it is an exaggeration to say with Schottmuller that it is the most frequent form of infectious endocarditis."

Blumer says that in New Haven, the subacute type appears much more frequently than the acute, if one excludes rheumatic cases and those which are terminal and often clinically latent. He finds it difficult to say whether the disease is actually increasing, or whether more cases are noted simply because there is an increasing ability on the part of the profession to recognize the condition.

Moravitz strongly inclines to the view that the disease has increased in Germany since the late war.

In Clawson's article, of the 220 autopsies which showed valvular disease 72 or 32.7% were of the subacute bacterial type, while 60 or 27% were of the acute bacterial type.

Pathology.—The lesions are due to the action of two factors:

(1) The toxic factor, a necessary accompaniment of an infectious process.

(2) The mechanical factor, the lodgement of emboli of various sizes detached from the diseased endocardium.

Cardiac Lesions.—The lesions in the heart present three outstanding peculiarities:

(1) Implication of valves already damaged by previous endocarditis.

(2) Involvement of the mural endocardium and chordæ tendinæ.

(3) Relatively slight impairment of the myocardium.

One of the peculiarities of the disease is the tendency of subacute bacterial endocarditis to attack damaged valves. In 150 autopsies, 58 or slightly over 38% showed evidence of old valve lesions. Blumer thinks that a more careful study of autopsies would show a much larger percentage of old cardiac lesions. Clawson agrees with these findings. The frequency with which the mural endocardium is involved is also noteworthy as contrasted with other types of endocarditis. In 150 autopsies 83 or 55.3% showed involvement of either walls of the cavities or the chordæ tendinæ or both.

The relatively slight involvement of the myocardium is also noted. In 150 autopsies, pathological conditions of the myocardium were mentioned only thirty times, and twelve of these showed only generalized fatty degeneration or cloudy swelling. Blumer thinks the above findings in the myocardium fit in well with clinical observations, where signs of myocardial failure usually appear only as terminal events.

Extra-Cardiac Lesions.—The more important ones are:

1.—*Vascular.*—The most frequent is *embolism.* The favourite sites are aorta, pulmonary artery, coronaries, iliacs, arteries of the extremities and above all the cerebral vessels.

Thrombophlebitis was noted in 6.6 of 150 autopsies. It is usually the veins of the lower extremities which become involved.

Embolic Aneurysms were noted nine times in 150 autopsies.

2.—*Visceral Infarcts.*—The striking feature of embolic manifestations in subacute bacterial endocarditis is the lack of suppuration.

Some authors think this is chiefly due to low virulence of infecting organisms, others that it may be due to a very small number of organisms present in some of the emboli.

3.—*Kidney Lesions.*—The characteristic lesions were first pointed out by Lohlein in 1910. Macroscopically the organs are only moderately enlarged. The surface is smooth and covered with punctate hæmorrhages, "flea bitten" (Gaskell). Microscopically, the lesion is described by Lohlein as an embolic focal nephritis. The lesion is due to lodgment in the glomerular capillaries of bacterial emboli. On account of patchy distribution of lesions, serious impairment of kidney function does not occur in uncomplicated cases.

Bearing of Pathology on Clinical Manifestations.—As the inflammatory process is usually engrafted on already damaged valves, there may be no change in the pre-existing physical signs

with onset of subacute bacterial endocarditis. Sudden development of murmurs may be due to ruptured chordæ tendinæ. The relatively slight involvement of myocardium results in no enlargement of the heart in about 12% of cases. An important feature in the clinical picture is the nonsuppurating embolic lesions.

Etiology.—The predisposing causes:

1.—*Age.*—A summing-up of different authors finds it a disease of adolescence and young adults. It occurs during the period of greatest incidence of valvular heart disease from all causes, excluding syphilis and arteriosclerosis.

2.—*Sex.*—Osler and Blumer make it 60% males and 40% females.

3.—*Relation of Previous Disease.*—Portal of entry of infecting agents—Venning could find a possible port of entry in only 27% of autopsies. Blumer could find it only in 15% of 330 cases. The teeth, tonsils and female generative organs were the most common offenders. The finding of the primary focus in many patients is a practical impossibility.

4.—*Relationship of previous infection,* particularly of antecedent rheumatic infection:

In 330 cases there was a history of:

Antecedent rheumatism	140	times	168 or more than 50%
" tonsillitis	18	"	
" chorea	10	"	

These findings are similar to Horder (1920).

Libman and Dube (1919) state that a past history of rheumatism is almost constant. Blumer thinks it may be safely assumed that in considerably more than one-third of the patients who contract subacute bacterial endocarditis the process is grafted on an old cardiac lesion.

There are two hypotheses advanced to explain the relation of rheumatism and old valve lesions to subacute bacterial endocarditis:

1.—Mechanical Factors—Roughness of valves, Inability of phagocytes to reach and destroy bacteria. Reduction of number of vessels in valves. (Babcock's theory). Increase in number of vessels (Coomb's theory). It can all be summed up by stating that our knowledge of vascularization of the valves at present is not accurate enough to permit us drawing intelligent conclusions.

2.—Bacteriological Point of View—Poynton and Paine believe in the theory of latency. Subacute bacterial endocarditis being the lighting up of an old focus. Steinert, Rosenow and Coombs suggest that pre-existing infections may alter the mechanism of immunity. It reduces the power of resistance to streptococcal infection.

Bacteriology.—Schottmuller, Libman and Horder, Major and others point out that there are only two organisms concerned with subacute bacterial endocarditis in the great majority of cases, namely the streptococcus group and the bacillus of influenza. Libman gives streptococcus viridans 95%, bacillus influenza 5%.

Streptococcus Viridans has been recognized under different names. First described by Schottmuller as streptococcus mitior sur viridans. Lenhartz in 1901 called it streptococcus parvus. Litten named it streptococcus gracilis. Horder, Andrews and Gordon referred to saphrophytic streptococci. Rosenow classified it as a modified pneumococcus. Hastings referred to it as coccus tenuens.

Growth.—Libman and Celler have pointed out that the organism grows slowly, colonies not appearing as a rule until 36 to 48 hours. It is necessary to watch plates at least six days. The number of streptococci which may be present in the peripheral blood varies very greatly and apparently bears no definite relation to the severity of the disease.

Symptomatology.—The clinical manifestations fall usually into two periods. (1) An early period in which symptoms and signs are those of a low grade infection. (2) A late period, when manifestations of embolism hold the prominent place.

In the great majority of cases the disease attacks patients with well compensated valvular lesions. The signs which are present are at first slight, except that in a considerable proportion of the patients there are definite signs of an old valvular lesion.

Onset is usually insidious. In 264 cases, 63% were gradual, 37% were sudden. Weakness is the most frequent early complaint. This is followed by fever and cardiac symptoms. With sudden onset the disease falls into three groups, febrile, in which chills, fever or sweats are prominent features. Arthritic, in which painful swollen joints dominate the picture. Embolic, with sudden appearance of blindness, hemiplegia, aphasia or acute pulmonary or abdominal symptoms.

General Nutrition.—Emaciation is specifically mentioned as a prominent feature in 10% of all recorded cases. Some patients remain well nourished up to time of death.

Febrile Reaction.—Patients do not usually run a very high temperature. In 116 patients the

daily maximum was 103° F. In 128 patients the daily variation did not exceed 4° F. in 96. In certain patients fever is accompanied by chills, in others by sweats, and in others, chill, fever and sweat occur in regular sequence. Some French writers have reported afebrile cases, but Debré seriously doubts the existence of such cases.

Cardiac Manifestations.—Dyspnoea is the most common cardiac symptom, palpitation ranks next. Cardiac pain is noted in about 12%. The heart signs are usually those of mitral and aortic disease. Sometimes there is no change in pre-existing murmurs. Usually there is a gradual intensification of or change in quality of murmur due to thrombotic masses. Definite loud murmurs may be caused by areas of vegetation on wall of left auricle. Rupture of a chorda tendinæ may cause sudden appearance of a vibrant murmur. Tearing or perforation of a valve sail may have a like effect. Among 279 cases there were five in which no murmurs were present. In regard to pulse rate or quality these are not greatly modified until late on in the disease.

Involvement of air passages.—Cough is a common symptom. In a good many patients there may be a definite bronchitis. In an average case, respirations range between 20 and 30 per minute.

Gastro-Intestinal Manifestations.—Anorexia is most common complaint. Vomiting may be associated with cerebral embolism. Diarrhoea is not infrequent. Constipation and flatulence may be prominent features. The liver, in many cases, is enlarged, hard and tender from chronic passive congestion.

Hæmatopoietic System.—As a rule, there is a moderate grade of anæmia, usually of the secondary type. There may be a progressive decrease or increase in the leucocytes. In the records of 289 cases, the spleen was enlarged in 163 or 56%. Definite clinical signs suggesting infarction occur in 47% of cases.

Cutaneous Manifestations.—As a rule there is an increasing pallor, slight at first, but late in the disease often associated with pigmentation. Libman has described this as the "café au lait" tint. The petechiæ which occur on the mucous membrane or skin are the most common lesions. They are presumably embolic in origin, and are apt to appear in crops. They are noted in about 38% of cases. The palpebral conjunctivæ, the axillary regions, base of neck and clavicular regions are common sites.

Osler's sign or Osler's nodes, described by him as "ephemeral painful nodular erythema" are situated in the fingers and toes, are one to one and one half centimetres in diameter, red, slightly elevated, appear in crops, involve pads or sides of digits and disappear in a few hours.

Vascular Lesions.—Peripheral arterial embolism is clinically manifest in 9% of cases. In a series of 300 cases, the radial artery was the one most commonly affected.

Nervous System.—In 300 cases, hemiplegia, diplegia or aphasia occurred in 20% of the patients, and are due to embolism or hæmorrhage.

Genito-Urinary Manifestations.—The evidence of nephritis may vary all the way from a faint trace to 5 gms. albumen per litre. About one-third of the patients show clinical evidence of renal infarction.

Bone, Joint and Muscle Manifestations.—Pain and swelling of joints is a common feature. The joint involvement may take form of arthralgia, acute arthritis or chronic anklylosing arthritis. Myalgia is a frequent occurrence in the early stage.

Ocular Manifestations.—Retinal changes are noted in about 10%. The hæmorrhagic lesions occur in crops. Embolism of the central artery of the retina or its larger branches with sudden blindness was noted in about 2.5% of cases.

Course, Duration and Termination.—The course is not progressively downwards. There are frequent remissions, but with few exceptions the disease finally terminates fatally. The duration varies widely. Of 281 records, death occurred between end of third and end of eighth month in 212 or 75%. Only nine lived over sixteen months and six of these lived over two years. The cause of death is cachexia, cardiac insufficiency and an embolism in 86%.

Differential Diagnosis.—Blumer quotes Osler, and states that the cardinal diagnostic features are fever, existence of an old valve lesion, embolic phenomena and positive blood cultures.

The diseases it is most likely to be confused with are:

1. Neurasthenia in the early stages.
2. Influenza in the early stages.
3. Malaria or typhoid fever.
4. Pulmonary tuberculosis.
5. Malta fever or trench fever.
6. Pyæmia with endocarditis.
7. Pylephlebitis.
8. G. U. tuberculosis.
9. Abscess of spleen, liver or kidney
10. Pernicious anæmia.

Prognosis.—Recovery is exceedingly rare. Billings in 100 cases saw one recovery. Libman in 150 cases saw four recoveries. Blumer saw one case recover.

Prophylaxis.—The removal of local foci of infection often located in teeth, tonsils, sinuses and female genitalia.

Treatment:

1.—General hygienic and dietetic treatment.

2.—Vaccine treatment is of little or no value. Autogenous vaccines are generally used. Intravenous doses of two or five million are given at intervals ranging from daily to every five days.

3.—Sero-therapy—Found not satisfactory.

4.—Transfusion has also been attempted.

5.—The following chemical substances have been used—Various preparations of silver. Quinine, hexamethylenamin, arsenic, salvarsan, eusol, sodium cacadylate, mecurochrome.

In closing Blumer states that the problems of the future are:

1.—What is the relationship between subacute bacterial endocarditis and acute articular rheumatism?

2.—How is a subvirulent streptococcus able to cause a grave general infection?

3.—What is the relationship of subacute bacterial endocarditis to other forms of bacterial endocarditis?

Why should Acute Empyema become Chronic?—E. Murstad (*Norsk Mag. f. Laegevidenskaben*, March, 1924 p. 185) has attempted to answer this question by an analysis of 28 cases of chronic empyema treated at two hospitals in Christiana between 1913 and 1922. In as many as 19 cases an explanation could be found for the conversion of an acute into a chronic empyema, and the most common fault was operating on an acute empyema too late. This was so in 9 cases. Another fault is evacuating an acute empyema through an intercostal space without resecting a rib and thus providing a free outlet for the pus; or the drainage may be mechanically ineffective because the bottom of the abscess cavity is much below the opening in the chest wall. In one of the author's cases the pus had been drained close to the sixth rib, although the empyema cavity extended to the ninth rib. In 2 cases drainage tubes had slipped into the pleural cavity, and in another case a fragment of rib, presumably chipped off during a rib resection, accounted for the persistence of the empyema. Other faults are leaving in a drainage tube too long, or letting it project too much into the pleural cavity, the unnecessarily long sojourn of the tube rendering the tissues about it rigid and incapable of collapse. In 4 cases there had been a serous effusion before the empyema developed, and it would seem that when a lung has been much collapsed by an effusion its chances of re-expansion are impaired if the fluid turns purulent. Yet another factor is the patient's sex; in as many as 24 of the 28 cases the patients were males, whose chest walls are comparatively rigid and incapable of retracting and following the movements of the lungs. The author calculates from the statistics of his hospital that about 5 per cent. of all cases of acute empyema become chronic and require a thoracoplastic operation for the closure of sinuses.—*Brit. Med. Jour.*, May 24, 1924.

Hydrochloric Acid Treatment of Rickets.—Martha R. Jones reports three cases of the successful treatment with hydrochloric acid of children suffering from rickets, and discusses generally the value of this treatment. Since it appears that rickets may follow a too high degree of alkalinity in the intestines of children on a well constituted diet, she suggsts that this disease may possibly be the result of insufficient hydrochloric acid in the gastric secretion, or of excess of alkalinity in the intestinal secretions. The addition of hydrochloric acid to milk in children in whom rickets appears to be developing seems to have met with considerable success, and animal experiments so far support this method of treatment. The author proposes to extend her investigations and to publish more fully later.—*Jour. Am. Med. Ass.*, February 9th, 1924, p. 439.

XUM

Editorial

THE CANADIAN TUBERCULOSIS ASSOCIATION

THE twenty-fourth Annual Meeting of the Canadian Tuberculosis Association held in April at Ottawa was unusually representative of the men and women actively engaged in the anti-tuberculosis movement throughout Canada, because of the Conference of Medical Officers held by the Department of Soldiers' Civil Re-Establishment and the Meeting of the Ontario Lænnec Society held during the same week.

It is of interest to recall the fact that a letter from the late King, then Prince of Wales, to His Excellency the Governor-General, in the year 1900, enquiring into the state of health in this country, was the inspiration that gave rise to the formation of the Association for the Prevention of Consumption and Other Forms of Tuberculosis. The original name of the Association fairly defined its objects, which have been realized by a consistent campaign of education, the initiation and furthering of much useful legislation, the promotion of the formation of local associations by which health centres have been organized and sanatoria built, the assembling and dissemination of useful statistical information, and, latterly, the initiation of investigations into actual health conditions prevailing in selected communities.

The Association has been a sympathetic link between the several provinces in matters of common interest. The membership, always small, was originally composed of a few altruistic men and women scattered throughout an enormous territory; the incentives and opportunities for meetings have been few and the funds meagre. In order not to embarrass local effort, there has been no broad appeal made for funds. The Dominion Government has provided an annual grant for administrative uses only, very small in the early years but latterly materially increased, and during the last three years small grants from the Dominion and Provincial Governments, and from the Canadian Red Cross Society and some of its Provincial Divisions, have made possible some special investigations in the several provinces. Criticism in the past has frequently been levelled against the Association, since it has failed to accomplish constructive undertakings when provinces and municipalities were reluctant to assume the considerable financial responsibility and Government assistance was not forthcoming. Such criticism is not justified, since the functions of the Association can only be to educate widely, and to stimulate and coordinate local effort. No fund exists which can be drawn upon to help to finance local investigation or construction. The success of the Association's work in the past should be rated by the growth of the whole anti-tuberculosis movement in Canada.

At the beginning of the century there were but three sanatoria in Canada, with less than 200 beds, whereas when war for a time suspended constructive effort, there were 30 sanatoria, with 1800 beds, in seven provinces. The war brought the long desired participation of the Dominion Government in sanatorium affairs, and the accommodation for patients was thereby doubled. This extra accommodation spread fairly over the several provinces now becomes useful for civilians, since war needs are diminishing. Today there are 4,343 beds in eight provinces; 1 bed is available for each two thousand of population; 56 for each hundred deaths; and Manitoba and Ontario have as many beds as there are deaths annually in these provinces. This great provision for treatment has cost $10,000,000, of which the Dominion Government contributed $3,500,000. Accommodation for 700 beds is now under construction. In five provinces 10% of beds in hospitals receiving Provincial Government grants are available for the

treatment of tuberculosis, but there is reason to think that in some of these the hospitality is reluctant and it is difficult for tuberculous patients to gain admission, even when in need of urgent surgical treatment.

In 1901 the death rate from all forms of tuberculosis throughout Canada was 180 per 100,000, or 9,600 deaths for a population of 5,400,000, while 20 years later the rate was 87, or 7,700 deaths for a population of 6,600,000. In two decades the death rate has been reduced 52%, the deaths have decreased 20% in actual numbers, while the population has increased 63%. While fully recognizing that the general decline of the death rate has been due to the many influences that have improved health, the anti-tuberculosis campaign may nevertheless claim a fair share of credit.

The result of the investigation at Framingham, Mass., as to the amount of tuberculosis actually existing in a community, and the survey into conditions in Saskatchewan by a Royal Commission, have stimulated the Association during the past three years to organize surveys of actual conditions, especially in regard to children of school and pre-school age, at selected localities in the several provinces. These have already been carried out in British Columbia, in Quebec and in Ontario, and arrangements are under way for similar surveys in four other provinces. These investigations have met with the enthusiastic co-operation of the medical profession, have greatly stimulated local interest, and have brought many patients to the sanatoria. Apart from the investigations regarding tuberculosis in children, there has been a broad study of general health conditions. These studies relate to groups of from 900 to 1400 children. Broadly speaking, one-third to one-half have proved to be sensitive to tuberculin, thereby showing that they are already infected with tuberculosis although living, for the most part, in small towns and rural districts.

From the laboratory standpoint, but little research in tuberculosis has been done in Canada. Generous support to establish research of this kind at one or more specially qualified laboratories would prove to be a great stimulus to all working here in the medical, apart from the sociological, field of tuberculosis. Contributions of importance to tuberculosis problems might reasonably be anticipated, detailed investigations in several of the sanatoria might be initiated by and coordinated with the larger laboratories, and the new interest would add much to the intellectual life of the sanatoria, now stultified by a laborious and often too monotonous routine; thereby the quality of the clinical work would be improved.

The matter presented at these recent meetings dealt so much with the absorbing details of clinical and sociological work that papers relating to propaganda, whereby the interest of the general public in the movement is sustained, were noteworthy omissions. At the meetings of the Association some part of the programme should be devoted to the presentation of work accomplished by and stimulating to lay men and women upon whom the ultimate success of the campaign rests. The aims of the Association are practical and worthy of support, and it is greatly to be hoped that the needed financial assistance for making this effective will be forthcoming. C. D. P.

THE RECENT CONFERENCE ON TUBERCULOSIS

UNDER the auspices of the Department of Soldiers' Civil Re-Establishment, the Canadian Tuberculosis Association and the Ontario Lænnec Society a three day conference was held in Ottawa early in April and was attended by most of the men in Canada whose special interest lies in chest work. Like its war time policy of cooperating with and helping existing sanatoria, the

D.S.C.R. policy of calling together for occasional conferences the men who have the medical care of tuberculous soldiers has been broad and constructive, and of benefit much beyound the bounds of its own special interest in the care of the ex-service men.

The majority of the papers read at this conference were of a high character and will, we are sure, prove of interest to our readers. Old timers could not help being impressed with the change in the topics and in the character of the papers presented which has taken place during the last decade. Ten years ago at such a clearing house conference much time would have been given to physical signs and the best methods of eliciting and appraising their value, while in the conference just finished, a scant half hour only was allowed to papers on this subject. The finding of bacilli, however, is as important as ever, and we have pleasure in directing our readers to the new and improved method worked out by Dr. Andrus of London which appears in this issue.

Perhaps one of the most important subjects which occupied the attention of the conference was the differential diagnosis between the many forms of pulmonary disease. The septic infections, their frequent incidence, and their many varieties, were discussed in several papers, and the treatment of their chronic sequelæ by rest and drainage secured either by posture, or by means of the bronchoscope or tube, and when these failed, by the surgical methods of pneumothorax, thoracoplasty, or lobectomy, was dealt with thoroughly. The history of some cases of long standing reported by Dr. Ferguson of Fort Qu'Appelle, in which he was successful in effecting a cure by the injection of bismuth into the abscess cavity will demand general attention. Septic conditions in the upper respiratory tract liable to make a cesspool of the lower respiratory tract and thus produce signs and symptoms simulating tuberculosis always call for careful investigation. Syphilis of the lung is another pulmonary disease which though infrequently met with may in some cases produce symptoms resembling those of tuberculosis. Dr. Blakeman in his paper demands for it prompt recognition and special treatment.

Among confusing non-pulmonary conditions, especially in soldiers, is disordered action of the heart (D.A.H. of the fighting lines). Effort syndrome was considered by the writer, Dr. Bond, as not a clinical entity but a symptom belonging to many and various conditions, and may be met with in tuberculosis. Gas poisoning, however, had not to any extent resulted in tuberculosis, but since the war 40% of those cases developed a disordered action of the heart. Among 500 such cases observed by him only ten undoubtedly tuberculous cases had developed, which is about the ordinary incidence, and goes to show that this disordered heart action does not furnish any special soil for the tubercle bacilli. Neurasthenia was considered by Dr. Mitchell to be an entity, a fatigue neurosis, often confused with tuberculosis, which although it had little to do with the disease itself simulated the mental attitude and the sense of inferiority in the struggle for existence brought about by tuberculosis. Tuberculosis which becomes evident after the neurasthenia has become pronounced, is not likely to be in any way due to the neurasthenia itself. The crux of the situation is in many instances how to get the tuberculous man suitably reintroduced to ordinary life and work, and the mental attitude of tuberculous patients has always to be considered and should be made a matter of record.

Ten years ago diagnoses would have been discussed to a finish with scarcely a reference to x-ray findings. Now, with the easily carried film in general use, illustrative films come up in every discussion. The technical excellence of the present films as compared with those of even two years ago was much commented upon, and the interpretation of the shadows noted in x-ray plates has come to be a considerable part of the problem of diagnosis. The annular densities met with in these films was discussed by Dr. Richards who covered recent literature fully and leaned finally to the view that

these densities were usually due to cavities. We also desire to commend to the attention of our readers Dr. Pritchard's sane rules for the interpretation of these plates, and his insistence on the value of the plate not only as an aid in diagnosis but as a very useful teacher of pathology.

Under the head of treatment, Dr. Miller discussed the lessons to be drawn from a series of 5,000 cases. Ten years ago the quasi-surgical treatment of pulmonary tuberculosis was just beginning in America. Thoracoplasty, the collapse of the chest wall by the removal of the rigid ribs, is a further step in the same direction, permitting the healing of a badly diseased lung. This subject was discussed by Dr. Archibald, and papers by him on the subject have appeared in recent numbers of our *Journal*. The operation can no longer be looked upon merely as on trial but must be regarded now as a permanent addition to the tuberculosis armamentarium.

On the whole this conference of 1924 covered a much wider range than would have been possible ten years ago. Diagnosis has broadened out to take in pulmonary conditions of almost all sorts, and treatment has passed considerably beyond the open air and rest which was considered about all that could be done at that not very remote day. We are glad to notice also that addresses showing an increasing interest in the tuberculosis campaign, and what is more, some knowledge of it, were given by the Governor-General, the Hon. W. R. Motherwell, Robert Forke, M.P., leader of the Progressive party, and the Hon. Dr. Manion.

D. A. STEWART

RESULTS OBTAINED

ON April 8th, 9th and 10th interlocking meetings were held in Ottawa by the chest specialists of the D.S.C.R., the Ontario Lænnec Society and the Canadian Tuberculosis Association. This is the second such meeting held by the D.S.C.R.; the success and value of the first gathering no doubt influenced the two societies to arrange contiguous dates for 1924. In this manner medical men prominent and interested in all phases of tuberculosis were brought together from all parts of Canada for three days' intensive work and the interchange of ideas.

Although no radical changes have taken place in the handling of the tuberculous, no cures substantiated, yet, progress has been made, and the meetings served in various ways a timely need. Many of the papers dealing with the interpretation of the various methods now available for the investigation of the suspect and positive tuberculous appear in this issue, and their limitations clinically, as well as their value, should be grasped. The overdiagnosis of tuberculosis is perhaps as big an error as underdiagnosis. Overdiagnosis usually postulates a misdiagnosis of a condition probably remedial. For the specialist we have a right to expect knowledge of and a mastery of all the tools available. Fortunately careful clinical work and common sense in the interpretation of x-ray plates should establish or exclude a diagnosis in the large majority of cases.

The results obtained with extrapleural thoracoplasty brought pointedly before the members the need of considering this method of surgical interference, not as a cure, but as an additional means of securing an arrest possibly not otherwise attainable. The wisdom displayed in the selection of cases is of paramount importance and is the rock upon which this method will become established or discredited.

The increased accuracy in our diagnosis of pulmonary tuberculosis today is undoubtedly due to improvement in radiological technique. The D.S.C.R. have in their keeping all stages of pulmonary tuberculosis, patients who will be under treatment or periodical examinations for all, or a large part, of their lives. From

the results finally recorded with these cases and their contacts we should obtain an accuracy hitherto impossible and information of the utmost value in our fight against this disease. Not only for the benefit of these more or less handicapped ex-soldiers, but for the benefit of future Canadian generations, no pains should be spared by the Government to induce physicians of the highest ability and ideals to associate themselves with the treatment or periodical examination of these men. The Minister in Charge (The Hon. Dr. H. S. Beland) as a physician will more readily see the value and advantages of an efficient medical personnel than may his colleagues in Government. As a profession we look to him to demonstrate the wisdom of medical efficiency and ideals. A well conducted medical meeting in which the papers are well selected, (as at Ottawa) and a spirited discussion, is the most effective means of bringing medical thought up to the highest standard. Equalization of medical judgment throughout Canada is the soundest prevention of dissatisfaction amongst those seeking, or in receipt of pensions, and fully justifies any expense which may have been incurred by the Government.

Whether our struggle against this disease is to be limited to the education of the profession in early diagnosis and treatment, to efficient public health service, and the necessary lay co-operation, this fight must be carried on. Research must be persisted in even though this results only in improved methods of diagnosis and selective treatment, and fails to produce a specific cure. In either event further progress will be made, slow and sure, or dramatic, as the case may be.

The Canadian people owe their information about tuberculosis largely to the past activities of the Canadian Tuberculosis Association. This association is showing evidence of growth and activity by establishing two yearly prizes—one for clinical and one for laboratory research—and by beginning a campaign to raise a research fund of at least $50,000. Is it too much to hope that Canada should take a predominant part in perfecting those methods which future practice will utilize and commend? It is, unless we pay our way.

"WHAT OF REST IN TUBERCULOSIS?"

DURING the past two decades, we have witnessed the swing of the pendulum from indiscriminate activity or exercise to carefully considered and well directed rest. No longer is the patient suffering from active tuberculosis carelessly told to go to the country, or into the highlands, and rough it. Even the lay mind is at last grasping the truth that all tiredness is not laziness; that loss of weight does not necessarily mean inadequate food intake, and that any physical condition, accompanied by fever, demands rest.

Conservation is now the key-note in the physician's advice, instead of dissipation of energy. Today, the general practitioner is following the example set by the sanatorium physician, in including on his rest regime, not only rest of body, but rest of mind as well. A condition of complete physical relaxation is now sought by a curtailment of every condition of living which increases cardiac effort; happy contentment is aimed at, and patients are advised to avoid introspection, worry, mental depression, and all emotional stimulants affecting the vaso-motor centres. Rest in bed is not all that is required, but also intelligent direction, and constant, interested supervision. This is unfortunately only possible in the sanatorium; for this purpose they were especially established, and are particularly maintained. Very rarely in a home can such a regime be duplicated.

That rest is not only considered important, but for the present paramount, is at once apparent, if one but notices the changes made in our sanatoria, to permit

of its possible achievement. Formerly, pavilion community life was thought sufficient for probably 75% of the patient personnel, and infirmary accommodation, for a probable 25%; today, through altered construction, appointments and equipment, 90% of beds in many institutions are now available for cases demanding this absolute rest. Heliotherapy, which as a therapeutic measure is now much in vogue and increasingly so, must credit some virtue to the rest accomplished while radiation is being obtained.

The surgeon also has interested himself in the cure of the tuberculous and has, perhaps, out-shone the physician in his results. By artificial pneumothorax (or pulmonary compression) he has instituted in cases in which it was practicable an actual splint for the affected lung, and where this procedure was contra-indicated, has by extrapleural thoracoplasty attained partial or complete lung collapse. While the physician is compelled to be content with partial physiological rest of an affected lung obtained through physical inactivity of the whole body, the surgeon can, and does, in many cases, obtain complete lung immobilization, and thus secures complete local physiological rest.

Taking the cure for pulmonary tuberculosis means time; time means money, and as a patient's contentment of mind is necessary, the financial aspect in all its phases must be adequately cared for, if rest is to be assured. Many agencies have happily arisen, and are being augmented, whereby the indigent patient suffering from tuberculosis can obtain treatment, and at the same time, be assured of effective assistance for his family during his enforced time of inactivity.

We conclude therefore by saying, that rest to be of its greatest value in the treatment of tuberculosis, must be scientifically applied, and be rest of mind, as well as rest of body.

W. B. KENDALL

EFFORTS TO CONTROL THE SPREAD OF TUBERCULOSIS IN GREAT BRITAIN

IN a recent number of the *Lancet* January 26, 1924, Dr. Salusbury McNalty has presented us with the story of the efforts made to check tuberculosis in Great Britain during the past half century—a story which at the present time may have a special interest for Canadians. In Great Britain, as probably in the majority of civilized countries, private efforts to isolate and check the spread of tuberculosis preceded any recognition by the state of the national importance and value of such work. Only slowly did the governments awake to the necessity of granting state assistance. Among the several nations of Europe the British Government appears to have been among the first to grant such aid, and after Villemin in France reported the results of his experiments in 1865 and asserted the infectiousness of tuberculosis, the English government granted funds to enable English investigators to test the accuracy of his statements. Koch's discovery of the tubercle bacillus in 1882 enabled a further notable step to be taken, and a departmental committee was promptly appointed to investigate the subject of the amount of tuberculosis in English cattle. The work of this and other commissions bore legislative fruit in the Dairies, Cowsheds and Milkshops Bill of 1899. In 1901 Koch's statement in London that bovine tubercle bacilli differed from the human, and did not transmit the disease to man came as a surprise to English bacterologists and another Royal commission was appointed to establish the relation between the disease in animals and in man. This commission finally reported that Koch's statement required modification and that human tuberculosis especially in children is in many cases due to infection by

bovine tubercle bacilli. As the result of this report and the realization by the state of the urgency for action a bill was passed for the compulsory notification of all forms of tuberculosis and in the establishment of a school of medical service.

With the passing of the National Insurance Act of 1911, the policy was adopted of placing all schemes for dispensaries, sanatoria, etc. under the control of the county councils, who were to receive some financial assistance from the state. The completely organized scheme involved a medical officer of health, special tuberculosis medical officers, dispensaries and home visitation, sanatoria for early cases, and hospitals for those more advanced. With the onset of the war in 1914 these schemes were brought to a standstill. In 1919, however an official Department of Health was established with a Minister at its head, and a special medical department solely concerned with tuberculosis was set up, with such an amount of central control as to enable it to make the schemes unified and comprehensive

Dr. McNalty dwells on the advantages of the tuberculosis schemes evolved by the state. Local authorities are allowed to develop just such measures as will suit their particular conditions. The general practitioner is an integral part of the plan. Expert consultants are available for any case. Attention is paid to the social as well as the medical aspect of the disease and finally all advances in treatment are immediately and sufficiently taken cognisance of, owing to the close coordination of the Medical Research Council with the work of the Ministry of Health. In his opinion one of the most important advances in the treatment of tuberculosis and one which the state has encouraged by financial subsidies is the establishment of training colonies and village settlements. These are designed to continue the oversight and treatment of consumptives after they have left the sanatorium, for the failures of the latter occur largely through so-called cured cases returning to poor environments. Colonies represent the development of the sociological side of tuberculosis, and while all efforts of the kind are still in the experimental stage they are watched by the state with the closest attention. The total public expenditure on tuberculosis schemes is now over twelve and a half million dollars per annum, but the cost if high is not too great for the steadily decreasing mortality from this disease. H. E. MacDermot

Editorial Comments

THE ANNUAL MEETING

When you were there you were satisfied it was a success. Now that the excitement has died down and you have had time to contemplate at your leisure, are you of the same opinion?

The Executive Committee desires your assistance in correcting faults and in developing the annual meeting to a high degree of proficiency.

Therefore we will welcome any criticism, destructive or constructive. Write to the Secretary, anonymously if you wish,, but for purposes of identification and reply, enclose in a covering letter. The Secretary will bring all communications before the next meeting of the Executive.

One criticism already expressed is that the programme was too full and there was little or no time for discussion of papers presented. Have you any others? A. T. B.

MENTAL HYGIENE RESEARCH FUND

It is with very peculiar interest and gratification that we have learned of the splendid gift of $75,000 from the Rockefeller Foundation to the Canadian National Committee for Mental Hygiene.

This sum, which is supplemental to the

LADY BYNG FUND for the same purpose, will be devoted exclusively to problems concerned with the application of Mental Hygiene principles to school children and juvenile delinquents.

The grant was made contingent upon the provision of an equal amount from Canadian sources, and as this has already been generously subscribed by Canadian citizens, the work will be started at once.

This fund will be devoted more especially to research, experimentation and demonstrations, and it is the firm belief of the National Committee that through this means a great deal will be done in Canada to serve Canadian citizenship and scientific medicine along these special lines. Not only from the scientific standpoint, however, will benefit accrue, but it is believed the National Committee will through this generous gift be enabled to start a development of thought and practice which will be a lesson to communities and governments, and be far-reaching in its economic effects on the country at large.

This munificence on the part of the Rockefeller Foundation is but another evidence of their widespread interest in medical education and practice, and more particularly is a distinct compliment to the efforts over six years of the Canadian National Committee of Mental Hygiene.

In connection with this work, a number of appointments will be made, particulars of which will be announced at an early date.

UNIVERSITY CLINICS AND THE ROCKEFELLER GIFT

The announcement has recently been made of a magnificent donation by the Rockefeller Foundation to the McGill Medical School and the Royal Victoria Hospital for the establishment of a University Clinic in the Department of Medicine.

The grant thus made marks another milestone in the progress of Medical Education in Canada, and illustrates once again the international character of the Rockefeller interests. Unofficially, the inception of a University Clinic in the Department of Medicine implies a Professorship on the full-time basis—a man who will devote all his time to the interests of hospital work, directing his energies to the treatment of patients, to the teaching of undergraduates and graduates, and to research. This is a fundamental arrangement, and while in their details, these University Clinics vary in some respects, the general principle is emphasized that a large clinic of this kind must have at its head one who can afford to devote his entire time to organization and academic work within the hospital precincts.

It has been held by some that there is some danger in creating such a position—that the head does not come sufficiently in contact with the outside world to make his teachings of use to the undergraduate student. The answer to such a contention is easy to find, for such a departmental head must already have had sufficient experience in clinical work in the outside world to enable him to give the benefit of his experience to the students whom he teaches. He may or may not see private patients, but, as a rule, any fees collected by the departmental head revert to the institution or to the clinic. This, after all, is what constitutes the technically full-time plan.

In the present instance, by this gift McGill University and the Royal Victoria Hospital will be placed in a unique position. With sufficient space allotted by the hospital authorities and an additional grant from them, the laboratories will be reconstructed on a scale sufficient to meet all the needs of scientific medicine for many years, while the possibilities of obtaining the highest type of medical assistance, both in the laboratories and in the wards, should enable the work to be carried on in the most efficient way.

Professor Jonathan C. Meakins, a former graduate of McGill University, who has for several years past occupied the position of Professor of Therapeutics in Edinburgh University, has accepted the call to fill this chair, and his record over many years has justified the expectations of the university and hospital authorities in believing that the new University Clinic should be maintained and developed in accordance with the high hopes and ideals of the Rockefeller Foundation, and of British medicine.

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Abstracts from Current Literature

MEDICINE

A Case of Anaphylaxis. Nagendra Nath De. *Indian Medical Gazette*, April, 1924.

A boy of seven had tetanus in 1919, for which he received four injections of anti-tetanic serum, and 25 injections of carbolic acid: there was complete recovery. Four years later, a wound in his leg brought up the question of giving him a prophylactic dose of this same serum; as a precaution he received a dram of calcium lactate in 24 hours, and next day 0.3 c.c. of adrenalin, soon after which he was given 0.2 c.c. of the serum (number of units not stated—Abstractor). Within a few minutes he became deeply comatose, with quickened pulse and lowered blood pressure. This lasted for nearly an hour, after which he gradually regained consciousness. There were no accompanying convulsions, and he was perfectly well next day.

In his comments the writer remarks on the presence of hypersensitiveness four years after the initial injection; the (apparently) inappreciable effect of the adrenalin in warding off the anaphylactic symptoms; and the comatose nature of the shock. H. E. MacDermot

The Mechanism of Peripheral Stasis in Myocardial Insufficiency—Capillary and Venous Pressures. Boas, Ernest P. and Doorseief, George. *Archives of Internal Medicine*, April 15, 1924.

The authors studied a series of nineteen cases, noting the clinical signs and symptoms, and measuring the venous and capillary pressures. They begin by stating that the conventional explanation of the peripheral manifestations of an impaired circulation, such as hepatic and pulmonary congestion, engorgement of the veins and oedema, is a rise in pressure in the right auricle which impedes the venous flow to the heart; that this in turn causes engorgement of the veins and a heightened venous pressure which is eventually transmitted to the capillaries. They quote several writers who conducted measurements of the venous pressure in patients with myocardial insufficiency, to support this view. Also others who reported an elevation of capillary pressure in patients with nervous pressure.

On the other hand, they remind us that Sir James Mackenzie has called into question the back pressure theory of heart failure, and has pointed out that the primary cause of a failing circulation is weakness of the heart muscle.

In regard to the authors' technique. For venous pressure determinations, they followed the method of Moritz and Von Taleora, and for capillary pressure determinations, that described by Danzer and Hasher. In all cases the venous pressure was first estimated and the capillary pressure was measured from thirty to sixty minutes later. The capillary pressure was measured with the patient in a sitting position with the hand at heart level.

In cases 1 to 5 the patients showed a heightened venous pressure, accompanied by a normal capillary pressure which had a tendency to be low. Those patients all gave clinical evidence of definite myocardial insufficiency. In cases 6 to 12 there were normal venous and capillary pressures. In these the signs of failing circulation were less evident. Cases 13 to 16 also showed high venous pressures associated with high capillary pressures, but they were, with one exception, cases of hypertension, which had consistently shown high capillary pressures.

In order to obtain further information of the effect on the capillary pressure of a heightened venous pressure, experiments were performed on a healthy young man, and the data collected showed that within the limits of the pressures that were studied, the venous and capillary pressures are independent.

Their findings lead them to the conclusion that the chief cause for peripheral stasis and œdema lies in a weakened cardiac contraction, and not in back pressure. In this they support the Mackenzie school of thought.

The only other explanation of their findings is that they measured not the true capillary pressure, but the pressure in the precapillary arterioles, as their findings showed a higher level than those recorded by Carrier and Reh-

ling in the latter's study of capillary pressures. On the other hand, the fact that they observed the effect of hydrostatic pressure on the readings, makes them believe that they were dealing with real capillary pressure.

L. C. MONTGOMERY

A Pathological Study of the Incidence of Surgical Mammary Lesions. Watters, W. H. *Boston Med. and Surg. Jour.*, Feb., 1924.

This is a *résumé* of experience in the pathological department of a general hospital during twenty-three years, with regard to tissue examination of the mammary gland. In this period the writer has examined 1385 specimens of the gland. Analysis of this material shows, first, that there are actually fewer cases of cancer of the breast now received at his laboratory annually, than were received twenty or twenty-five years ago. Secondly, the ratio of mammary cancer to the total number of surgical operations was more than twice as great twenty-five years ago, than it is today. Thirdly, the figures show a steadily increasing proportion of non-malignant mammary conditions now coming to operation; this may partly account for the apparent retardation of the malignant types.

He concludes that it is reasonable to assume that in the *clientèle* of his hospital the rapid increase in the incidence of cancer elsewhere reported, does not hold good in regard to mammary conditions.

H. E. MACDERMOT

SURGERY

Human Blood Grouping—A Review of its Present Position and Applications. Learmonth, J. R.; M.B., Ch.B. *The Glasgow Med. Jour.*, March, 1924.

The author divides his paper into two main divisions, one, the history of the work on the various blood groups with all the present day knowledge; and the second division dealing with the clinical and practical application of the data so collected.

The discovery of three blood groups in 1901, by Landsteiner, the independent discovery of these and another in 1907 and 1910 by Jansky and Moss, and the final apparent discovery of an extra group by Guthrie and Huck are considered and discussed freely. The methods of testing are discussed and nothing new recorded, save the little known method of preserving permanent records by drying the blood slides slowly and covering with a layer of flexible collodion or weak celloidin.

The reaction between serum and cell apparently is due to the "pseudo-globulin" in the serum, which may be dried and kept for months and retain its agglutination property. The various groups depend on the albumen content of the red cell, and the reported alteration in an individual's group after operation, anaesthetics, etc., may be due to the altered globulin content.

The establishment of the agglutinophilic property of the red cell is present at birth, but the iso-agglutinin of the serum may not become active for two years. Prolonged anæsthesia may occasionally increase the power of the iso-agglutinin in the serum, and red cells previously unaffected may become readily agglutinated. In occasional group IV. persons there are additional iso-agglutinin elements. These infrequent variations may account for some of the post-transfusion reactions in multiple transfusions, in certain blood diseases and after febrile and anæsthetic states.

The discussion of reactions by the author adds nothing new, and the symptoms, signs and variations of reactions cited are those commonly encountered. He states the toxic dose of sodium citrate is 10 to 15 grammes, and for a 1,000 c.c. blood transfusion only 2 grammes are required, emphasizing its low toxicity. The fundamental groups II and III are found in largest numbers in Western and Eastern races respectively.

In eclampsia McQuarrie found 70% of his cases of toxæmia showed incompatibility between the maternal and the fœtal bloods. Grühzit found that in every case of eclampsia the maternal serum agglutinated the baby's red cells. These findings have been discredited by Chavasse and others.

The bibliography includes over fifty references in several languages and offers a most excellent list for those desiring special data or a *résumé* up-to-date of the laboratory and clinical aspects of blood transfusion.

CHAS. K. P. HENRY

Principles Involved in the Treatment of Acute and Chronic Empyema. Graham, Evarts A. *Surg., Gynec. and Obstet.*, April, 1924.

In Graham's opinion, the three most important principles in the treatment of acute empyema are: (1) the avoidance of open drainage during the stage of acute pneumonia, free drainage at a suitable time to be carried out in nearly all cases; (2) irrigation of the cavity; and (3) maintenance of the nutrition of the patient.

In the pneumococcal type of empyema the pneumonia has usually subsided before the empyema is recognized. In the streptococcal type, however, the empyema is usually coincident with the pneumonia. In the streptococcal empyemas in the United States Army during the war, the mortality dropped from 40 per cent. to less than 5 per cent. when open drainage of the pleural cavity was deferred until after the pulmonary disease had subsided. Graham believes that the high death rate in open thoracotomy during the course of pneumonia is due to the very low vital capacity in such cases. Repeated aspiration in such cases is recommended. In about 10 or 15 per cent. of the cases no operation for drainage is required.

When drainage has been decided upon, it should be adequate and not a compromise. The site of the drainage should obviously be at the most dependent portion of the cavity. Graham prefers rib resection to intercostal drainage. At the time of operation the corresponding intercostal nerve as well as the one immediately above and below are injected with 95 per cent. alcohol. This procedure eliminates much of the post-operative pain. Irrigation of the cavity is effective in hastening healing. Nothing better is known than Dakin's solution.

Forced feeding with a high caloric diet should be the rule. The average gain in an adult should be from 2 to 5 pounds per week, during the first few weeks after establishing drainage. Other important measures are a liberal allowance of fresh air and heliotherapy. Artificial aids to the spontaneous obliteration of the cavity are blowing exercises and general exercises. A spirometer is recommended. Several months should be allowed to elapse before the artificial closure of bronchial fistulae

The most common causes of chronic empyema are inadequate drainage, too late drainage, too early drainage, and the presence of foreign bodies, including sequestra from the ribs. A certain number are, however, due to an unavoidable fibrosis of the lung. In the treatment of chronic empyema, conservative methods, *e.g.* proper drainage and irrigation, should be employed for several weeks or months, then various plastic procedures may be instituted. These plastic operations are of three general kinds; those in which an effort is made to have the lung reach the parietes, those in which the parietes are made to meet the lung, and those in which the cavity is filled with living tissues, such as a muscle flap or a skin flap. F. B. GURD

The Etiology and Treatment of Non-Tuberculous Pulmonary Abscess. Whittemore, W. *Surg., Gynec. and Obstet.*, April, 1924, Vol. 38, p. 461.

In the last hundred cases of pulmonary abscess seen by Whittemore, 66 had followed an operation on the upper respiratory tract under general anaesthesia. This is startling, although as Whittemore points out, the percentage is very small when the thousands of tonsillectomies and extractions of teeth which are done every day are considered. It is only just to the nose and throat specialist to add that, except in one instance experts had operated only on the serious cases.

From 10 to 30 per cent. of the cases may be expected to be cured by expectant and postural treatment. If at any time during the course of treatment by medical measures the condition of the patient becomes worse, surgery should be seriously considered. Whittemore believes that only a very small number of cases are cured by artificial pneumothorax. With regard to bronchoscopy this author is of the opinion that it may be valuable if used early, but that in long standing cases although some improvement may take place, it seems very doubtful if any permanent cure can result.

In operative treatment, when the lung and pleura are adherent, local anaesthesia should be employed. When these tissues are not adherent, and the normal pleural cavity must be opened, some form of differential pressure anaesthesia should be used. Whittemore prefers

pressure from the gas oxygen machine, using an ordinary snugly fitting mask. It is necessary to locate the abscess at the first operation. In most cases the lung and pleura will be adherent over the abscess. If this condition is found the lung is immediately opened and the abscess cavity found and drained. If an adherent area is not discoverable the pleura cavity should be opened widely and the lung palpated for an abscess. This area should then be brought up to the chest wall and sutured there. A gauze sponge should be placed against the abscess area and the wound closed. Three to five days later under local anaesthesia the wound is again opened. Adhesions will have formed so that the abscess can be opened and drained without danger of empyema. An incision is made into the lung and the abscess broken into with the finger. This is thought better than the use of the actual cautery. A soft rubber tube is employed for drainage. In the acute abscesses, four or five weeks' drainage must be employed; in the chronic cases three or four or six months may be necessary.

From 60 to 70 per cent. of the cases operated upon may be expected to be cured or permanently improved. F. B. Gurd

PAEDIATRICS

Impetigo Contagiosa in Children. Smith, D. T. and Burky, E. L. *Johns Hopkins Bull.*, March, 1924.

In studying the bacteriology of this common skin disease of childhood, it was found that in a series of nine cases hemolytic streptococci occurred in six and staphylococcus aureus in three instances. It is possible that these only represent the predominating organisms of the skin or of the particular environment of the patient, and play but a secondary rôle to some specific virus. Yet it was possible to predict which of these two groups would be reported from the culture merely by the effect produced by ammoniated mercury ointment (1/3 the usual strength). This ointment is very effective in the treatment of streptococcus cases, but not for those due to staphylococcus. A 5% solution of gentian violet in 20% alcohol was very effective in both groups. This was painted on the affected area and when dry was covered with some bland ointment such as vaseline or boric acid and then bandaged. The bandage was allowed to remain undisturbed for two days. In addition to killing the organisms the gentian violet seemed to have a stimulating effect on the regenerating epithelium. The bland ointment is necessary to keep the surface moist and to prevent scab formation. L. M. Lindsay

Germanium Dioxide for Anaemias of Childhood. Schmitz, H. B. *Jour. Lab. and Clin. Med.*, March, 1924.

Germanium stands adjacent to arsenic in the periodic system, hence it is not surprising that it should exhibit similar beneficial effects on the blood-forming organs. This has been demonstrated by experiments on animals and men.

Schmitz presents the results he obtained in thirteen unselected cases of anaemia in childhood. Germanium was given by mouth in the form of the oxide in a 0.2% watery solution. Thirty to sixty milligrams were given daily or every other day, until from 300 to 1000 mg. had been taken.

There were five cases of anaemia following malnutrition and acute fevers; two cases accompanying acute nephritis; one cardiac case; four cases of Gaucher's splenomegaly and one of Von Jaksch's anaemia. All the cases with the exception of Von Jaksch's anaemia, showed a definite response by marked increases in the number of erythrocytes and in the hemoglobin content. The most notable results occurred in anaemia following malnutrition and acute infections. L. M. Lindsay

Fatal Convulsions in Four Children whose Father Suffered from Lead-Poisoning. Thomson, John, M.D. *Brit. Jour. Child. Dis.*, Oct.-Dec., 1923.

Dr. Thomson cites the case of a family of six children, the last four of whom developed convulsions at more or less frequent intervals without any demonstrable cause. It was then discovered that the father had been a painter and had developed signs of lead-poisoning one year before the birth of his third child, which was the first to have convulsions.

Dr. Thomson observed the last member of the family from the age of ten months until he died at eighteen months. During this period

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the child was in excellent bodily and mental health—apart from the fits. The attacks were quite different from ordinary infantile convulsions — affecting the respiratory functions especially.

The third, fourth, and fifth child had taken fits precisely similar in character to those of the patient. They had all died before reaching nine months of age. The two first children, born before the father had plumbism, were strong and well, and had never suffered from convulsions.

This family illustrates the established fact that plumbism in the father is sufficient to cause abortion, premature birth, and expulsion of macerated foetuses in the mother, although she is healthy, and fatal convulsions in those children who survive birth. L. M. LINDSAY

DERMATOLOGY

Bromide Eruption due to Bromo-Seltzer Waugh, J. F. *J.A.M.A.*, May 17th, 1924.

Bromo-seltzer is a popular remedy for headache and may be procured at certain soda fountains and drug stores without difficulty. Little attention is paid to the size of the dose and frequently the customer is allowed to choose the amount.

This is the report of a case with an extensive eruption in a nervous man, aged 40, who had taken this drug regularly for two years. He found it necessary to increase the dose to obtain relief, until the contents of a sixty cent bottle were consumed in one day. Within a few weeks the face, chest, arms and legs showed a bluish-red papulo-pustular rash, mostly pea-sized. Scars, more or less pigmented, followed many lesions. Those on the arms and legs reached the size of a large coin and were covered with crusts. On the lower half of both legs were large, crusted, partly ulcerated plaques. Painful pus infections appeared on many lesions. There was also a bluish pallor characteristic of acetanilid intoxication. The seltzer habit probably arose from the desire for the effect of acetanilid. Opium addicts frequently substitute seltzer for the poppy extract.

Bromo-seltzer contains 10% of pot. brom., 4.5% of acetanilid and 1.2% of caffein. The average teaspoonful dose contains pot. brom. 7 grains, acetanilid 3 grains, and caffein 4/5 grain, and when larger, repeated doses are taken the danger zone is soon reached.

A number of fatal cases are cited. In one (*J.A.M.A.*, July 16th, 1910) a woman took a dose of bromo-seltzer for headache without relief. She then took antikamnia(containing acetanilid) and died in one hour from the combined depressant action.

Three-quarters of a ton of bromo-seltzer was sold at one of Chicago's large retail drug stores in one year ending June 30th, 1923.

Dermatitis medicamentosa is produced by the ingestion of many drugs and is due to their excretion through the glands of the skin. The bromides, when taken over an extended period, produce in adults, an eruption resembling a pustular acne, but show a wider distribution and an inflammatory areola. If the habit persists the pustules are larger and raised, nodular areas form, with some ulceration. Papillary and fungoid lesions somewhat resembling blastomycosis, are occasionally seen.

In young children the eruption presents raised angry looking, round, darkened patches and crowned with small pustules. These are usually on the limbs and reach the size of a fifty cent piece.

The writer pleads for a restriction of the sale of this potent nostrum and that its harmful possibilities and contents receive proper publicity. C. R. BOURNE

The Differential Diagnosis of Small-Pox. Cameron, A. F. *The Lancet*, March 15th, 1924.

In the majority of cases it is on the cutaneous signs that we are compelled to depend in making our diagnosis of small-pox. Corroborative value should be given to the history of contact with the infection and signs of previous vaccination, but their value should not be overestimated. Vaccinia and small-pox may run their course together.

Small-pox produces three distinct types of eruption, erythema, purpura and a focal lesion, viz. a vesicle. The erythema occurs at the early period and the purpura towards the latter part of the primary fever, while the focal rash begins to appear towards its end. The co-existence of erythema and purpura suggests the possibility of variola and the addition of the focal lesion makes it very suggestive.

The erythema associated with mild attacks is not distinctive, *per se*. It is patchy, evanescent, migratory and usually avoids the face. The typical form is that which occurs in toxic cases. It usually presents large, symmetrical, well-defined, brilliant areas almost vermillion on the extensor surfaces of the large joints and the trunk. Cases of extreme severity show almost universal erythema and in the lack of punctate character differ from scarlet fever.

The term "purpuric sign" is applied to haemorrhage from the mucous membrane as well as the skin, whether small and petechial or massive, bruise-like lesions. These are present in any toxaemia but show a greater average frequency and severity in small-pox. A frequent cause of error is due to concentration of the prominent feature, viz. the toxaemia and the erroneous diagnosis of "blood-poisoning" is made.

Given the onset of fever accompanied by the purpura sign, variola should occupy first position as a possible cause, and the probability increases with the severity of the purpura, having regard to the number and type of the lesions and the general skin involvement.

The focal rash is made up of a varying number of vesicles and these are deep-seated. Appreciation of this process, that the vesicle formation is deep-seated will assist in the differentiation of several conditions which are at times mistaken for small-pox, viz., secondary syphilides, measles, urticaria and acne. The vesicle gradually recedes as the pustules form and at the end only the crust remains. The larger pustules rupture, the centres sink, causing a cup-like depression or umbilication. Modified lesions may occur in old age or in ill-health The vesicles are less prominent, flat, ill-defined and irregular in contour simulating varicella. Similar lesions may appear in a severe toxic attack amongst the more evident purpuric lesions. Abnormal lesions are the result of a partial immunity, natural or acquired. The lesions are small, the vesicle and pustule do not involve the whole papule and if immunity is high a small crust in the top of a hypertrophied papule is the only evidence, after two or three days, that pustulation has occurred. The most valuable differential feature in the normal lesion is that evolution is regular, continuous and rapid. This change is apparent almost hour by hour and is rather emphasized in cases of partial immunity.

The distribution of the rash of natural small-pox has a distinct differential value. There is a tendency to affect the face and extremities in preference to the trunk *i.e.*, the rash is centrifugal rather than centripetal. The lesions cluster on parts which have been subjected to pressure or irritation, during or shortly before the incubation period. Ricketts states "the most potent factors are exposure to air and friction with clothing and to their efficacy every case of small-pox is a testimonial."

Where small-pox occurred in a patient with an extremity covered with a surgical dressing the protected portion was less affected than corresponding parts. The most commonly covered parts of the body are the groin and axilla and these show the greatest freedom from the focal rash.

C. R. BOURNE

Two cases of Restoration of the Heart's Action one temporary and the other permanent, by means of the intracardiac injection of Adrenalin. (Deux cas de reanimation du coeur l'une temporaire, l'autre definitive par l'injection intracardiaque d'adrenaline). Lenormant, Ch. Richard F., et Sénèque, J. *La Presse Médicale*, Mar. 15, 1924.

When the heart stops during an operation the surgeon naturally hesitates to make use of an expedient so serious as heart massage. When performed through an abdominal incision the contraction of the diaphragm may make it impossible to compress the heart properly. Moreover, in some cases, even when done properly it is inefficient. The writers give details of two cases where intracardiac injections were used. In one the anaesthetic was ethyl chloride. Artificial respiration was carried on for twelve minutes. Two c.c. of 1-1000 adrenalin were injected into the heart and in twenty seconds it began to beat. After five minutes it stopped again. Another injection restored the action, but it stopped permanently in fifteen minutes. In the second case spinal anaesthesia with novocaine-adrenalin, (15 centigrammes of novocaine) had been given for hysterectomy. The patient was in the Trendelenberg position and the heart and respiration stopped. Five or six minutes afterwards an intracardiac injection of adrenalin was given.

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The needle was almost immediately felt to be oscillating and soon the heart was beating forcibly. Consciousness was not restored till next morning. Complete recovery took place. The writers consider that intracardiac injection in syncope should be made with as little hesitation as is subcutaneous injection. W. B. HOWELL

Spinal Anaesthesia. Rytina, Anton and Tolson, Howard L. *Annals of Surgery*, Feb., 1924.

The secretion, excretion and circulation of the cerebrospinal fluid plays an important rôle in spinal anaesthesia. The fluid is continually being secreted by the choroid plexus and to a certain extent from the arachnoid membrane. It is continually being absorbed into the lymphatic system. There is thus a continuous circulation and the whole quantity is perhaps replaced four or five times in 24 hours. Passage of the anaesthetic drug into the circulation begins immediately after the injection. Within five or ten minutes the drug has diffused to its full extent and the patient may be put into the Trendelenberg position. In high spinal analgesia the stomach and intestines are contracted and the peristaltic movements increased owing to paralysis of the sympathetic, the motor influence through the vagi being unopposed.

The writers used apothesine chiefly in their 387 cases; but novocaine in a few. Ordinarily they give the injection through one of the lumbar spaces, but when desirous of a high field of analgesia they make the puncture between the 11th and 12th dorsal vertebrae. They give five drops of a 1 in 1000 solution of adrenalin with 1-30 gr. of strychnine immediately after the injection. If there is a marked fall of blood pressure 10 to 15 drops of adrenalin are given intramuscularly. Should the pulse show much slowing an intramuscular injection of caffeine sodium benzoate is given. There was headache in 8 cases. It came on in most of them several days after operation. It never persisted more than ten days. There was one case of paralysis of the external rectus muscle of the eye. This got well in four weeks.

The writers consider the method suitable for practically all operations below the nipples. Marked myocardial degeneration, blood pressure below 100 mm., and cases where there is pericardial or pleural effusion are generally unsuitable. Recent untreated syphilis is a contraindication. W. B. HOWELL

Rectal Anaesthesia in Children (L'Anaesthesia par Etherization rectale chez l'enfant). De Dardel, Maria Guessay. *Revue Médicale de la Suisse Romande*, July, 1923.

The writer's patients are given castor oil at 11 a.m. on the day before the operation and after this only liquid nourishment. At midnight the rectum is irrigated, after which all food is withheld. An hypodermic injection of pantopon, graded according to age, is given 15 minutes before the ether is administered. The face is covered and the child laid on its side and encouraged to sleep. A mixture of two grammes of ether to each kilo of body weight is prepared in a closed flask, with an amount of olive oil equal to one-third the volume of ether. It is well to have some more of the mixture in reserve to replace any which may be expelled.

The injection, slightly warmed, is introduced slowly by means of a syringe and well oiled flexible tube. Special care is now taken to keep the room quiet. Two minutes after the injection ether can be smelt in the breath. If after twenty minutes the child is not asleep a few drops of chloroform or Billroth's mixture are given. The writer gives details of 27 of her cases. Fourteen of these were perfectly satisfactory. Four were satisfactory so far as the operation was concerned, but there were symptoms, such as cyanosis and pallor, which gave anxiety to the anaesthetist. In these cases the dose of ether was probably too large. In six cases some chloroform or Billroth's mixture had to be given by inhalation. Four of these had expelled some of the ether-oil mixture.

Advantages of this method.—The anaesthetist is out of the way in operations about the head. Muscular relaxation is complete. After-vomiting is rare. The child is somnolent for a considerable time after the operation.

Disadvantages.—When anaesthesia has commenced one loses control over it, in spite of evacuation of the bowel when the dose seems to be too large. The preparations are troublesome and render the method unsuitable in emergencies. Another disadvantage is the uncertainty. Some children are more easily

affected than others. However, very little additional anaesthetic by inhalation is necessary when the rectal injection is insufficient. The ether when absorbed is carried first to the liver so that this method is absolutely contra-indicated in cases of disease of liver.

There was only one case of proctitis in the author's series. In another bronchopneumonia occurred which might possibly be attributed to the ether. W. B. HOWELL

Cardiac Massage. Levy, A. G. *British Journal of Anaesthesia*, April, 1924.

Levy points out that what is ordinarily called cardiac massage is not massage at all, but the setting up of an artificial circulation. Its scope is confined to certain cases of heart failure upon the operating table, such as asphyxia, extreme overdose of a volatile anaesthetic and chloroform syncope. He emphasizes the necessity for early recourse to heart massage, that is, within five minutes. He describes attempts to grasp the heart from below the diaphragm as "a mere waste of time, although a few such attempts have been successful."

The hand should be introduced within the left pleural cavity and the right ventricle compressed as well as the left. Effective artificial respiration must be maintained throughout.

W. B. HOWELL

Relative Blood Cell Volume in Pulmonary Tuberculosis.—Both healthy and tuberculous subjects were chosen by B. H. Schlomovitz, B. E. Hedding and E. J. Kehoe, Milwaukee, for this study. The first denominations showed that the relative blood cell volume was fairly constant for the same person over a period of time. Healthy or normal men had relative corpuscular volumes of from 44.5 to 48 per cent.; that is, the corpuscles centrifugated and sedimented out in a sample of blood were equivalent to from 44.5 to 48 per cent. by volume of the total sample of blood drawn. Forty tuberculous men who were examined could thus be classified into three groups. Class A was the group whose relative corpuscular volume was above 48 per cent. which is the highest figure in the normal group, and the figures go up to 52.4 per cent.; about one-half are in this class. The figures for Class B coincided with those for the healthy men. Class C was the group below 44.5 per cent., with some as low as 40 per cent. The fact that the tuberculous patients could be grouped into three classes stimulated inquiry in reference to the clinical status and progress of the cases, particularly those in Class A and Class C. There are no cases of incipient tuberculosis at this hospital. Further comparisons demonstrated that the method provided a far better index of the patient's status, than hemoglobin values and red blood cell counts. All in Class A are responding favourably to treatment and developing increased resistance. Those in Class C are doing poorly, and failing more or less rapidly. Class B patients must be analyzed further and watched for a period of time before any decision can be made, although, in general, the patients are in fairly good condition. For Class A there seems to be a similarity of corpuscular volume response to Weigert's law for the development of immune bodies in the blood stream; that is, more than enough are created. The men in Class A are doing well; there is something in the blood that does not stop at the normal range, from 44.5 to 48 per cent., but goes beyond it, overshoots the mark, as it were, up to 52.4 per cent., at least temporarily. The term "temporarily" is used, for there are some that have been observed for a period of only five months. In Class C, on the contrary, there seems to be an exhaustion of some element.—*Jour. Am. Med. Ass.*, June 7, 1924.

A New Operation for Slipping Patella.—Robert Soutter, Boston, passes a strip of fascia lata through a tunnel extending through the patella and the upper end of the tibia at an angle of about 45 degrees.—*Jour. Am. Med. Ass.*, April 19, 1924.

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Medical Societies

ASSOCIATION OF AMERICAN MEDICAL COLLEGES: ANNUAL MEETING AT OMAHA, FEBRUARY, 1924

The Annual Meeting of this Association has become increasingly important each year, and represents the best considered opinion on medical education on this continent. Every large medical school in the United States and Canada is represented (there are 70 Class "A" medical schools in the United States), and the membership for the most part consists of the principals of universities and the deans of medical schools.

Methods of modern medical education formed the chief subject of discussion, and one may summarize the more conspicuous features of the meeting as follows:—

1.—Pre-medical school education is everywhere deficient, and there is a great need of better educators among our teachers.

2.—The average pupils entering a medical school to-day are insufficiently taught in English expression, composition and speaking.

3.—The medical curriculum attempts to teach the student too much rather than emphasizing the more essential principles in all branches.

4.—There seems to be very little unity of plan in education in our medical schools, and the need was felt of seeking more definitely the real objective of medical education, both from the scientific and from the social side.

5.—The correlation of fundamental sciences with clinical teaching is much in need of development. Patients should be introduced to students in the earlier years in order to illustrate in a clinical way their teachings. On the other hand, the pre-medical sciences—physiology, anatomy and chemistry—should be re-introduced with more emphasis during the later years of study.

6.—Our system of examination for students is in need of reconstruction.

Some further discussion took place as to the relations between the hospitals and the universities, and the general opinion expressed was to the effect that in all first-class medical schools, there should be the closest possible relation between the hospital and university, and that all clinical teaching appointments in hospitals should be controlled by the university.

A committee was formed to deal with the problems of medical education in general, and from its personnel one may expect a very enlightening report in the course of a year.

Some consideration was given to the financing of medical schools. The general impression created was that non-endowed medical schools and those which received no State aid were at a considerable disadvantage, and were liable in the long run to succumb. The annual budgets of all medical schools have increased beyond all bounds within recent years, so that to-day it is impossible to keep pace with the more important medical schools on the Continent without budgets that are far in excess of those enjoyed by the average university.

SECTION OF ELECTRO-THERAPEUTICS—ROYAL SOCIETY OF MEDICINE

The Lancet, March 29th, 1924.

A discussion was held on the clinical results of deep x-ray therapy. Dr. Wm. Mitchell, speaking from an experience of twenty years, feared that there had been much unwise comment in the press, with the raising of many false hopes as regards the treatment of quite hopeless cases. Forty-eight of his 183 cases were hopeless before treatment was commenced. He thought it impossible to promise cure of malignant disease by x-ray therapy, chiefly because metastasis was an unknown quantity before treatment was begun. If a case was treated while in a hectic condition, it was probably made worse than before. The most favourable cases were those with a good blood count and high haemoglobin index. Good results were seriously impaired by the fact that many patients had to return to bad sanitary conditions.

Mr. Sampson Handley thought that the surgeon needed the help of the radiologist in

nearly all cases of malignancy. But in deep x-ray therapy one had to consider the effects on the patient as well as on the growth. The biochemist was still investigating the former point, and it had been shown that irradiation of the head, neck, and thorax had little effect on the urine, but in the case of the abdomen irradiation produced an immediate large drop in the amount of urine, with a modification of its constituents; there was also a marked fall in the blood-urea content. Heavy x-ray doses applied to the abdomen often produced profound asthenia and loss of vitality, a contrast to the feeling of well-being following treatment by radium in even inoperable cases. The effects of deep x-ray therapy in amounts necessary for the surface treatment of deep tumours were so marked as to make this degree of treatment undesirable and even harmful. The effect on the tumour itself was in certain cases undoubtedly beneficial, but in others actual stimulation of the growth took place, and in support of this statement he instanced three cases in which new superficial metastases had developed within the area treated by deep x-ray therapy. His general view was that a medium must be observed between a dosage which was inadequate to act on the growth, and one which was harmful to the patient; that balance, he thought, had not yet been struck. Buried radium, in cases where the area to be dealt with was small, had great advantages over deep x-ray therapy in that the radium allowed for a maximal irradiation of the growth with a minimal inclusion of the tissues generally.

Dr. G. Cooper had had experience with 400 cases of all varieties of malignancy. In most cases he thought there was a general improvement in general health soon after beginning the x-ray treatment. A decline in health seemed to be associated with a return of activity of the growth. There was usually a cessation of discharge, with relief of pain, and, especially in the case of hard rays, the formation of fibrous tissue which probably helped in limiting the spread of the disease. His best results had been in genito-urinary and pelvic conditions generally, but cancer of the cervix had shown a tendency to relapse. There were also encouraging results in cancer of the rectum. Except in one case (in which radiation had been given at the time of operation) he had found the treatment in cancer of the stomach very unsatisfactory. A much more favourable report could be made concerning the treatment of primary glandular enlargements. But in cancer of the thyroid and parotid glands, although he had had good results at first there had been subsequent development of metastases in nearly every case.

Other points taken up were: the advantage of sometimes giving a single large dose instead of several smaller ones, the idea being to avoid the stimulation of a growth to greater activity; the combination of x-rays and radium, using the latter for the primary growth and the rays for the region permeated by the malignant cells. Septic cases did not do so well by either method. The use of chloretone before irradiation helped to ward off sickness. Severe menorrhagia had been found to yield well to x-rays. H. E. M.

THE ASSOCIATION OF MILITIA MEDICAL OFFICERS

On Wednesday afternoon, April 9th, a meeting of the Association of Medical Officers of the Active Militia was held at the Chateau Laurier. Colonel J. W. Bridges, C.B.E., the Director General of Medical Services, opened the meeting with a short address of welcome, when the chair was taken by the past President, Major-General J. T. Fotheringham, C.M.G. Over 30 officers, representing the military districts in eastern Canada, were present, and the keenness and enthusiasm shown by all members, augurs well for the future of the service, even in these times of curtailed militia activities. This was the largest and most representative meeting since the war and it is fully expected that next year the meeting will be on a par with those of pre-war days.

The following officers were elected for the ensuing year:—Honorary President, Hon. E. M. Macdonald, Minister of National Defence; Honorary 1st Vice-Pres., Mr. G. J. Desbarats, C.M.G., Deputy Minister of National Defence; Honorary 2nd Vice-Pres., Colonel J. W. Bridges, C.B.E., Director General of Medical Services; President, Colonel W. H. Delaney, Quebec; 1st Vice-President, Colonel Perry Goldsmith, C.B.E., Toronto; 2nd Vice-President, Colonel G. E. Beauchamp, Montreal; 3rd Vice-President, Colonel John Gunn, C.B., O.B.E., Winnipeg; Secretary, Captain L. M. Dawson, M.C., Ottawa; Assistant Secretary, Captain H. D. Courtenay, Ottawa; Treasurer, Captain A. M. McCormick, Ottawa; Chairman of Local Committee of Arrangements, Colonel A. T. Shillington, Ottawa.

In welcoming the medical officers attending the meeting Colonel Bridges said:—

General Fotheringham, brother officers and comrades.

I am glad to welcome you here to-day after an interval of ten years. Much has transpired in that time. The great European War, which some of us looked upon as a hazy possibility, has been fought; the nations have been left almost bankrupt; and nearly twenty-six and a half millions of the bravest and best of our manhood, have either made the supreme sacrifice and are in their graves, or bear the scars of battle. The British Empire had total casualties amounting to 3,266,362, and the other nations in proportion.

We should, however, be proud of the preparatory

training carried out by our corps, in the old pre-war days, under General Carleton Jones, D.G.M.S. General Jones was an officer well ahead of his time. He entered his tenure of office at these headquarters with great enthusiasm and succeeded in organizing and equipping the Field Medical Units with the more important essentials, some years before the commencement of the Great War. After getting the organization completed General Jones was anxious to *test* it in a practical way so he got permission to hold a purely medical camp in London, Ontario, in 1912. The Russo-Japanese War had recently been fought and from their statistics, we knew tolerably well what number of casualties, on an average, we were likely to have, from a given force engaged; also the nature of the wounds. About eleven or twelve Field Medical units assembled at that camp so it was possible to bring some of our Field Ambulances up to war strength for the purpose of the schemes in hand and also to see how they could handle the actual casualties on the field. These casualties were orderlies from some of the other units, bearing tags and acting as wounded. These schemes usually took place in rough country, in pastures, on the rear of farms with marshy ground, streams and ditches to be crossed and conditions similar to those met with on active service were imitated as far as possible. These so-called wounds were actually dressed by first field dressings, slings, splints, etc. The tags were signed by the officer or other rank who dressed the wound after which the patient was evacuated through the different stations. Sometimes two or three hundred were handled. The object of the signing of the name was to criticize, if necessary, the treatment at the conference which was subsequently held. As the patient passed through each station he was properly recorded.

General Jones put his finger on the weak spots in our organization and at the end of the camp told me that we were much too weak in transport facilities for evacuating wounded with dispatch. He said the continental European armies had a more generous allowance in this regard provided by the columns of the Red Cross and the Teutonic order of Knighthood.

The same defect was realized at the war office, England, and as late as the beginning of 1914 the D.G.M.S. in London recommended that some motor ambulance cars be added to the British Field Ambulance, but there was a party in England at that time who opposed any expenditure for ships, guns or warlike stores.

How disastrous were the early days of the war in August and September. The medical history of the retreat from Mons, is far from pleasant reading. One historian tells us that the 4th Field Ambulance was squeezing its jaded horses into the retreating column, when a staff officer, thought to have been the Brigade Major, ordered them back to the next village, Landrecies, to dress the wounded and bury the dead. They loaded all the wounded possible into their wagons, but in trying to carry out the last part of the order, they were surrounded and eight officers and 219 other ranks of the 4th Field Ambulance were taken prisoners. Nine other officers from the 6th and 19th Field Ambulance shared the same fate. On taking up an old book in our office the other day, I found a report by Sir Ian Hamilton who had come over from England, to report on the Canadian Militia, in 1913. In one section he states as follows:—"In Canada, as elsewhere, the Army Medical Corps is well ahead of all the other arms of the service in their preparedness for war, a fact largely due to the wholehearted support they receive from the medical profession in all its grades. As the militia is, or should be, the general expression for all forms of national activities, the other departments of our national life, such as the railways and telegraph companies; the motor and cyclist unions would do well to take a leaf out the doctors' book and organize themselves for the defence of their country." How well that good opinion has been realized during the war, I leave you and the country to judge.

The triumph of preventive medicine has been the admiration and wonder of the scientific world. In all previous wars, for every one killed by the enemy there were nine at least who died of disease. In this war as far as the Canadians were concerned, these figures have been reversed and to show you how well they have been reversed, out of 56,639 who lost their lives overseas from all causes, 51,768 were battle wounds. In this I include 89 who went down in the Llandovery Castle, leaving 4,871 who died of disease, accident and other causes.

In the South African War, out of a comparatively small force, there were 73,550 cases of enteric fever with a death rate of 13.7 per cent. In this war there were only 7,000 cases of the enteric group with a death rate of 3.58 per cent. One writer has said that these figures "should be emblazoned in letters of gold and posted in every army medical mess, as a *permanent war honour.*"

Have we learned anything from the war? Well, one important thing we have learned is a good deal about the defects of our population as shown in the examination of recruits. This is important to know, not only from a military but from an *industrial* standpoint as it shows the more important diseases which are sapping the vitality of the nation. Out of nearly three million men between the ages of eighteen and thirty examined by the American army, 468 per thousand, or nearly fifty per cent, were found unfit for front line service. This number might be said to be a fair representation of the whole and as this class would represent about one-fifth of the population, the balance having a higher disease ratio, it has been figured out by experts that about one-quarter of the population of the United States is physically defective. This is important to us for our population are living under very similar conditions, they are happy, contented and well fed, for the most part. The health and the defects of a population are important from a national standpoint and are important to those charged with the care of children, and of training pupils in our schools and colleges. It is of academic interest from a sociological and biological standpoint and is, as someone has said, of "eugenic significance as it shows the failure of man to make good and keep up with our highly artificial civilization." The American Army found 269 different kinds of diseases; 5.4 per cent were rejected for tuberculosis, 5.8 per cent. for venereal disease, 5 per cent. as under size and under weight, the rest due to such diseases as curvature of the spine, goitre, hernia, varicose veins and diseases of the skin, eye, ear, nose, throat, teeth, glands, etc.

Our statistics in the early days of recruiting were not carefully kept owing to haste in getting the men to the front. When the Militia Service Act came into force, however, they were carefully kept, and they showed we were a little better than the Americans, only 400 per 1,000 being unfit for front line service. England had 410, Germany 400, France only rejected 290 per 1,000; I suspect that under the great pressure she was obliged to close her eyes to many of the minor defects found in her recruits. In all these countries many of these recruits rejected as unfit for *intensive training* and front line service were later taken into the lower categories and were able to carry on certain selected services such as hospital orderly work, cooks, clerks, etc.

I think the importance of having a medical man on the committe, for the conservation of *man power,* was well demonstrated in the case of Sir Auckland Geddes, who, as adviser to Lord Derby, is credited with arranging the details of these categories, whereby men with some quite serious defects, might still perform valuable service for the country.

Is there any other lesson we have learned? Yes, the medical history of the war discloses the fact that there still remains much to be done by us in future wars. *Preventive medicine* has accomplished much, but there yet remains much to be studied. In one group of 106,267 admissions to hospital, 26,879 were due to skin

disease, chiefly scabies, that is about 25 per cent. In another group, louse-borne diseases, pyrexia of uncertain origin, trench fever, myalgia, etc., amounted to another 25 per cent., making about 50 per cent of the whole admissions due to *dirt* and *vermin*. All these are *preventable* and if preventable diseases are not prevented, it is up to the medical service to determine means and make recommendations to meet the condition. *We must keep the army clean*, for *wastage* from trivial diseases is just as serious, while it lasts, as wastage from wounds. Our motto must be the maximum of work and the minimum of wastage.

Now what is our service doing at present? We are mostly marking time and trying to struggle on a little, keeping the home fires burning as it were, until a brighter day dawns for the militia of Canada. We have our medical units fairly well organized, especially in officers.

There are some people in Canada at present who are horrified at the very mention of another war; who frown down upon any expense for military requirements; who look upon any military activity as a reversion to militarism and argue that it is antagonistic to the idea and spirit of the League of Nations. In 1919 the League of Nations was looked upon as the cure for all wars. It was hoped that in the future all quarrels and friction between nations, would be settled by good will, by reason and by *arbitration* but, owing partly to politics, and partly to the agreement to the covenant being too elastic and the machinery, which was necessary to enable it to function too intricate and involved, it has not been a practical success. The idea was noble; the results disappointing. It was *great* in promise but small in achievement for we observe that even now some of the nations can be restrained, with difficulty, from flying at each others' throats.

Research, in devising the most speedy and effective methods for slaying the enemy, is still active. We hear of a new gun having lately been invented, which, by electricity, throws a shell three or four hundred miles. We hear of gasses being discovered so deadly, that the most poisonous used in the last war are but as a lady's perfume in comparison.

At the present day, in spite of the League of Nations and its propaganda, the stability of all governments, and the treaty-making power of all nations, depend on *potential force* whether the ordinary, law-abiding citizen is conscious of it or not; so, in the meantime, we will be obliged to keep in Canada, the militia for training purposes, to aid the civil power, and, as a "national insurance."

Gentlemen, we are here to-day to reorganize the Association of Military Medical Officers. You know the object of this Association. To strengthen and encourage the Army Medical Services and to keep military medicine and military medical organizations as much to the fore as they were at the time of Sir Ian Hamilton's visit in 1913.

Fate of Infants of Tuberculous Mothers.—M. A. Couvelaire (*La Gynécol.*, January, 1924, p. 44), in a communication to the Société d'Obstétrique et de Gynécologie de Paris, surveys the fate of 63 infants born (since 1921) of mothers suffering from pulmonary tuberculosis and with tubercle bacilli in the sputum. All the children, of whom 61 were living and apparently healthy, were strictly separated from their mothers from the time of birth onwards. In half their number the individual weight was six and a half pounds or more. No fewer than 23 (38 per cent.) were dead within the first month after birth, and the percentage mortality was not greater among those of inferior weight, nor those whose mothers were at the time of labour in relatively more advanced stages of pulmonary tuberculosis. Turning to the cause of death in these infants Couvelaire was unable to find precise anatomical explanations, and compares their decease to the extinction of a lamp which has burned up its oil; these children are born, he concludes, with a diminished "coefficient of vitality." The after-history of the remaining infants, who survived the first month, appeared to show that in conditions of complete isolation from the tuberculous parent or parents—and conditions which in other respects were hygienically satisfactory — their health and viability were not inferior to those of infants born of healthy mothers.—*Brit. Med. Jour.*, May 24, 1924.

Treatment of Injuries during the Acute Stage by Diathermy.—By use of diathermia in the treatment of 186 cases, Edward C. Holmblad, Chicago, has found that: 1.—It is a valuable analgesic during the acute stage of injuries. 2.—By its uses, the pain was reduced more than 50 per cent .in all cases during the first twenty-four hours, and that 174 patients were more than 90 per cent. relieved of pain in less than one week's time. 3.—Twelve cases were not noticeably affected. 4.—In seven cases, the rate of restoration of atrophied muscles and stiffened joints was markedly hastened. 5.—In fifteen cases of simple fractures, diathermy was a most valuable analgesic during the acute painful stage. 6.—These results have been obtained under difficult circumstances, in that the patients were receiving compensation, and hence their personal desire to get well was not always present.—*Jour. Am. Med. Ass.*, June 7, 1924.

Obituary

Dr. F. R. Eccles died in London Ontario, on June the 12th. Born in Lambton County, he was educated at the Sarnia Grammar School and at the University of Toronto, graduating from the latter institution in 1867. After post-graduate study in New York and Great Britain, Dr. Eccles began practice in Arkona, moving shortly afterwards to London. A man of many activities he taught in the medical department of the University of Western Ontario as professor of physiology and gynaecology, and for many years held the position of Dean of the college; the Amasa Wood Hospital of St. Thomas was founded largely by his efforts.

Dr. George Musson of Toronto died suddenly on the 23rd of May. Born in Toronto in 1873, Dr. Musson was educated at Bishop Ridley College, and at the University of Toronto School of Medicine; he subsequently graduated in homeopathy, and practiced at Chatham till the outbreak of the Great War. Going overseas in 1914 he served through the war in the Canadian Army Medical Corps reaching the rank of lieutenant-colonel. On his return he established himself in Toronto where he was practicing at the time of his death.

Dr. Martin O'Carroll died in St. Michael's Hospital on May the 27th. A graduate of Trinity College, Dublin in 1887, he had practiced in Ireland, and had been in the medical service of the British government. He served as medical officer in the Grenadine Islands and later in St. Vincent.

Dr. E. E. Harvey, a well known physician of Peterboro, died in that city on May the 20th. A graduate of the University of Toronto, a medallist of the class of '93 he practiced in Norwich for 22 years, moving later to Peterboro. Keenly interested in public affairs, he had acted as secretary of the Board of Trade, as Town Councillor, as member of the Public Library Board, as Police Magistrate and as School Trustee at Norwich, while later in Peterboro he was a liberal supporter of public enterprises, particularly of the Chamber of Commerce.

Dr. D. G. MacNeill died in the village of Arva on June the 6th; he was a graduate of the Western Medical College and of the University of Toronto School of Medicine, at which institution he received the silver medal on his graduation. Dr. MacNeill had been coroner of the London township for many years.

Dr. J. Macoun died in Campbellford on May the 10th, after a distinguished life in our profession. He was the oldest physician in Campbellford, a member of the Royal College of Physicians and Surgeons, and an active militia man who in spite of his advancing years went overseas for service.

Dr. Obadiah McCullough an old member of the one-time famous Rockwood Academy and a writer of no inconsiderable merit, died in Guelph, on June the 6th.

Dr. Edward Rodd, a former inhabitant of Durnham died in Detroit on June the 3rd.

Dr. John G. Gee died suddenly at the Western Hospital on May the 28th, following an operation.

Pneumonia Simulating Appendicitis in Children.—The acute onset of pneumonia with few or no clinical symptoms may simulate acute appendicitis, especially in children. Abdominal symptoms of pain, tenderness, rigidity and distention may be present as in the cases cited by Paul A. White, Davenport, Iowa. Difficulties in diagnosis are multiplied because of the tender age, lack of intelligence, or fear on the part of the patients. A severe chill at the onset, temperature over 102, and a leukocyte count near or over 20,000, should engender extreme caution and intensify efforts at differentiation. A careful urine examination should always be made.—*Jour. Am. Med. Ass.*, March 1, 1924.

Asthenia following Antityphoid Inoculation.—R. Bénon (*Paris méd.*, January 26th, 1924, p. 94), who records an illustrative case in a soldier, states that nervous and mental sequelae in antityphoid inoculation are rare, the commonest being a general nervous, mental, and muscular asthenia or depression. He had previously related a case in which post-vaccinal asthenia was succeeded by mania. In the present case the asthenia following inoculation was complicated by motor symptoms consisting in astasia-abasia, neuropathic ataxia, and hysterical tetany. The patient was predisposed to this condition, as at the age of 12 he had developed the same symptoms as the result of being separated from his parents. Complete recovery took place when the patient was sent to the front, where he gained a decoration at Verdun. —*Brit. Med. Jour.*, May 24, 1924.

Medical News from the British Empire

GREAT BRITAIN

The conference on the hospital problem, between members of the Labour party and representatives of the medical profession, was held at the end of April. The full report of the proceedings makes interesting reading, if for no other reason than that it shows what a degree of opposition was developed against the idea of a state-aided hospital system. But for the present it will be enough to report the resolutions which were arrived at; to wit:—

That the accommodation, equipment, and finance of hospitals generally are inadequate and must be supplemented.

That the geographical distribution of hospitals is uneven, leading to overlapping and the lack of co-ordination. The unit of such co-ordination should be such as to include a sufficiently large population to constitute a satisfactory unit.

That there should be closer relationship between voluntary hospitals themselves; between the voluntary hospitals and the various hospitals provided by local authorities; between the curative and preventive medical services, and between the hospitals and the private medical practitioner.

That some form of public assistance is essential if a complete and adequate hospital system is to be maintained, and the development and maintenance of an adequate hospital system should be provided in such fashion as will preserve the best features of the present voluntary system. H. E. M.

AUSTRALASIA

Attention is being drawn to the gradual depopulation of the islands of the Pacific region by disease. There is apparently a grave lack of control of public health in these regions. Each of the powers interested has its own system. The remedy suggested is that for purposes of public health, the islands should be divided into five groups, with five properly equipped bases under the control of one co-ordinating body invested with sufficient power to be called the International Health Board. L. C. M.

AUSTRALIA

J. W. Newman Morris, M.B., writing on National Insurance in Australia as affecting the medical profession, considers that it would be of benefit to the average practitioner, and sums up as follows:—"If Parliament and people are convinced of the need and possibility of such national insurance and are prepared to accept compulsion in a new form... we must be prepared to claim certain rights. Such rights would include adequate representation—the adequacy being agreeable to our idea of it—and payment at rates suitable to the medical profession. We must insist that medical benefits will ensure full and complete provision of treatment for insured people, including treatment by general practitioners and specialists, with laboratory and x-ray facilities, etc. Whatever be our attitude it must be a well-considered one, which we can justify, and, above all, it must be united." L. C. M.

SOUTH AFRICA

Reference has been made to certain proposed legislative changes in the standing of those unregistered persons "practising" medicine and surgery in South Africa. These proposed changes took the form of amendments whose result would be to greatly enlarge the opportunities for such unauthorized practice. In one particular, for example, the suggested change would make it necessary to prove that in the case of one accused of illegal practice, he had actually received gain, hire or reward. Another suggested amendment was to the effect that none of the legislative requirements "should be deemed to apply to the practice of the religious tenets of any Church." And, finally, there was to be an additional clause by which the existing law should not be deemed to apply "to the practice of any particular form of drugless healing, if the healer proves to the satisfaction of a Board prescribed by Regulation that he is qualified by training or/and experience to practice such particular form of healing. An appeal shall lie from the decision of such Board to the Minister."

These amendments were considered by a Select Committee, which voted in favour of the first two, and rejected the last.

Several witnesses appeared before the Committee to set forth the claims of the various cults. They, too, had a "star" witness, a phenomenon of the kind which not long ago confronted the Canadian profession under similar circumstances. This witness took the rather ingenuous course of claiming the most cordial relations with the medical profession. He declared that in some places he had received eighty per cent. of his cases from medical men. But he was prompt in refusing to content himself only with cases from such sources!

The legislation in this matter is apparently still unsettled. General political affairs in South Africa have taken a turn which makes the work of the Select Committee of minor importance, and the Bill in question seems to be shelved for the time being.

H. E. M.

INDIA

Medical research in India is confronted with problems and conditions of a peculiar nature. These problems are taken up by Lt.-Col. S. R. Christophers, I.M.S., in his presidential address at the Medical Research Section of the Fifth Indian Science Congress, from the point of view of what disease costs India. Beginning with the death rate, it appears that the figures are high, the average rate in 1921, for example, being 30 per thousand, some provinces even reaching 44 per thousand. The corresponding rate in Great Britain for 1923 was 11.6 per thousand. Not only that, but there is a decreased expectation of life in India. It can be shown that in England 530 out of every 1000 reached the age of 50, whilst in India during the same period, only 186 in 1000 reached that age. After this age, there is no great difference in the figures, so that it is clear that in the main the variation is due to disease acting in the younger years, a striking comment on the standards of disease prevention and control.

The chief factor in this high death rate is the occurrence in India of epidemics on a scale not easily appreciated in European countries. Naturally, the areas and numbers of people involved are of enormous extent. India has a population of 360,000,000. But even so, there is no comparison, proportionately, between the epidemics of India and those of Europe. For example, there was a serious epidemic of typhoid in Maidstone in 1897, in which 1,900 out of 35,000 people were affected. But in 1908, in the Punjab there was an epidemic of malaria which affected simultaneously a population of about 20,000,000, in an area of from 5,000 to 6,000 square miles, with a quarter of a million deaths in three months, the death rate in some regions rising as high as 300-400 per thousand per annum. A similar epidemic had occurred in 1892.

Equally extensive epidemics of cholera have frequently taken place, one cause for its spread being the carrying afar of the infection by those attending the great pilgrim assemblies at various points. Recent work has shown that relapsing fever must also be reckoned with as a major epidemic disease.

A curious feature of these vast malaria epidemics is that "when mapped out, as they can be by lines of equal mortality (*isothans*) they show a central area or focus where conditions are at their worst, and concentric zones of diminishing effects as this focus is departed from." It is thought that the cholera epidemics would show something of the same peculiarity, but such mapping for this disease has not yet been done. Colonel Christophers would call such gigantic exhibitions of zymotic disease *zymonic*, from their likenesses in distribution to cyclonic disturbances in the atmosphere.

Apart from such epidemics, it has yet to be determined what diseases contribute most to the mortality. Of the seven million deaths reported for 1921, nearly five million are headed as "fevers." It is extremely important to find out what proportion of these are due to malaria, but an accurate estimate is at present impossible. Still, "that malaria is the most important cause of mortality in India is scarcely to be doubted." Famines, which once decimated tracts of India almost after the fashion of these *zymones*, are no longer direct contributing factors to the mortality .

It is then pointed out that the number of epidemic diseases in India not only includes some of the most serious types found in temperate climates, tuberculosis, for example, but also a formidably long list of those peculiar to the tropics. Certain deficiency diseases are also specially prevalent, beri-beri, diabetes, etc.

As regards population, the returns show an increase of 6.4% in the first decade of this century, whilst in the second there was an increase of only 1.4%, and in certain provinces there have been actual decreases. This almost stationary tendency can only be due to excessive death rate; there is no question of a lessened birth rate, and emigration is inconsiderable.

Further, the prosperity of India is very closely bound up with its agriculture, but the development of this pursuit may depend almost completely on the prevalence of disease. Irrigation for opening up new areas means more chances of malaria, and this disease is apparently a serious menace in the great Canal Colonies. Large projects in certain areas at the foot of the Himalayas for the growing of sugarcane are being carried out. The conditions are said to be highly favourable, but with all that the ultimate success of the scheme will depend on whether or not the malarial parasite gains a foothold in the region.

These are some of the existing conditions in India on which Colonel Christophers dwells, as causing a drain on the country's resources of population, and so, indirectly, on its industries. The cost of this drain is beyond computation in money, and to be dealt with at all adequately it must mean the application of scientific research. "It is no question," he says, "of applying such knowledge only as we now have, nor of purchasing the necessary knowledge from Europe. Europe cannot help, for her problems are different and she knows nothing of India's requirements. Only by the encouragement of research in her own territories can India arrive at a proper basis for effectively combating the many diseases that affect her populations, and it is the duty of an enlightened Government to allocate a due proportion of her revenue to this purpose." H. E. M.

News Items

GENERAL

ASSOCIATION OF MILITARY MEDICAL OFFICERS

With reference to D.M.O., Circular Letter No. 25 of 1924 re the Association of Military Medical Officers. I am to inform you that this meeting was held on the 9th of April, 1924, and was attended by over thirty medical officers. After luncheon was over a short address was given by the D.G.M.S., and General Fotheringham, Senior Past President, was asked to take the chair. It was the unanimous opinion that the Association should be reorganized. No change was made in the Constitution and By-Laws. It was resolved that the next meeting take place in Ottawa in February next. Representatives were present from St. John, N.B., Quebec, Montreal, Kingston, Toronto, Hamilton, London, Ont., and Ottawa. The following officers were elected to fill the positions as follows:—

Honorary President, Hon. E. M. Macdonald, Minister of National Defence; Honorary 1st Vice-Pres., Mr. G. J. Desbarats, C.M.G., Deputy Minister of National Defence; Honorary 2nd Vice-Pres., Col. J. W. Bridges, C.B.E., Director General of Medical Services; President, Col. W. H. Delaney, C.A.M.C., Quebec; 1st. Vice-Pres., Col. Perry Goldsmith, C.B.E., C.A.M.C., Toronto; 2nd Vice-Pres., Col. G. E. Beauchamp, C.A.M.C., Montreal; 3rd Vice-Pres., Col. John Gunn, C.B., O.B.E., C.A.M.C., Winnipeg; Secretary, Capt. L. M. Dawson, M.C., C.A.M.C., Ottawa; Asst. Secretary, Capt. H. D. Courtenay, C.A.M.C., Ottawa; Treasurer, Capt. A. M. McCormick, C.A.M.C., Ottawa; Chairman of Local Committee of Arrangements, Col. A. T. Shillington, C.A.M.C., Ottawa.

A circular from the Post Graduate Medical Association of London calls attention to a special post-graduate course to be given at the Hospital for Consumption and Diseases of the Chest, Brompton, S.W.3., between August 11th to August 23rd, 1924. The fee for the course is 4 guineas. Those wishing to attend should send their names to: The Secretary, Fellowship of Medicine, 1 Wimpole Street, W.1.

At a meeting of the Executive Committee of the Canadian Medical Association in December it was decided that a copy of our *Journal* should be forwarded free to all the Canadian medical missionary stations in the East. We have at this date received thanks from the mission at Rajputana in India, Dayabari in Bengal, Dhar in Central India, Akidu in South India, all of them expressing their great appreciation of the value the *Journal* has been to them in their work and of the courtesy of the Association in forwarding it.

NOVA SCOTIA

Dr. C. E. Kinley, of Glace Bay, has gone to Western Reserve University for the purpose of taking up special research work.

A movement has been initiated looking towards the establishment of a hospital in the town of Digby, and a large amount has been subscribed towards the erection of a new building for the Colchester County Hospital at Truro.

Must interest is being taken in the post-graduate course to be given during the first half of September under the auspices of the Dalhousie Faculty of Medicine. As has already been stated in these columns, several eminent teachers from other colleges have consented to take part in the teaching, so the course may be regarded in the nature of a Canadian summer school. A popular feature is that no fee is charged, and the course is open to all qualified practitioners, irrespective of their college or residence. It is felt that many physicians from the interior will be glad to take advantage of this opportunity to combine a holiday with a reasonable amount of work at a season when Halifax offers many delights to the pleasure seeker.

The Valley Branch of the Medical Society of Nova Scotia held its annual meeting at Kentville on the 17th of May. Addresses were given by Doctors H. K. MacDonald and H. A. Chisholm, of Halifax, and Doctors A. F. Miller and A. S. Burns (the President of the Branch), of Kentville. Doctor F. S. Messenger, of Middleton, was elected president for the ensuing year, with Doctors Gorse (Canning), Braine (Annapolis Royal) and Roberts (Digby) as vice-presidents. Dr. C. E. A. DeWitt, of Wolfville was re-elected Secretary. The branch holds its next meeting at Annapolis Royal.

A recent number of the *Halifax Herald* gives an interesting account of the situation created by the arrival of the ship *England* at Halifax, on the ninth of April, 1866. A few days after this ship had left Queenstown, with more than 1,200 passengers, a death occurred which was attributed to Asiatic cholera. The disease spread rapidly amongst steerage passengers and crew, although the cabin passengers escaped. Fifty-six deaths had occurred before the ship reached Halifax, and fresh cases were appearing continually. Dr. J. H. Slayter, port quarantine officer, placed the ship in quarantine and associated himself with the two ship's physicians. The conditions were found to be so appalling that Dr. Slayter accepted the assistance volunteered by Doctors Garvie and Gossip and a brother of Dr. Garvie who was at that time a student in medicine. All of these went into voluntary quarantine, and not only worked assiduously in the endeavour to relieve the sufferings of those who were ill, but assisted in digging graves for those who died. They worked day and night, and shortly before midnight on April 17th, while in the act of closing a coffin, Dr. Slayter collapsed and fell to the ground. James MacCormack, who resides at Halifax, was assisting Dr. Slayter at the time, and states that his face turned black almost instantly. He died at four o'clock the following morning with unmistakable symptoms of cholera. At the succeeding session of the provincial legislature Dr. (later Sir Charles) Tupper, in proposing a vote of money to Dr. Slayter's widow, made an eloquent reference to Dr. Slayter's devotion and heroism. Mr. MacCormack gives a vivid account of his experiences in connection with the infected ship. On boarding the vessel, scores of people were crawling about the decks, contorted into grotesque shapes by the terrible pain from which they were suffering. That night perhaps a hundred heavily weighted corpses were launched into the waters of the harbour. Later about two hundred were buried in the sands of Thrum Cap, while a hundred or more were interred in the southern part of MacNab's Island. Altogether nearly five hundred of those on board the *England* perished. Patrick Reardon, a Haligonian who had volunteered his services at the quarantine station, also died from the dread disease. Only a single case developed in the city, which rapidly proved fatal.

QUEBEC

The death took place suddenly at her late residence, 2145 Jeanne Mance Street, of Dr. Elizabeth Walker Bruere, M.D. (Paris) wife of Dr. Andrew A. Bruere. She was born in Edinburgh and received her education both in Edinburgh and in Paris, at which latter university she graduated first as B.Sc., and later as M.D. Mrs. Bruere is survived by her husband and leaves no family. Dr. A. A. Bruere who is a graduate of Edin-

burgh, is head of the Bacteriological Department in the Royal Victoria Hospital, and assistant Professor in Bacteriology at McGill Univeristy.

Dr. Albert Angers of Malbaie has been appointed Coroner of the Saguenay District, replacing Dr. Paul Emile Paquin.

Mental Hygiene Research Aided. The gift of $75,000 bestowed by the Rockefeller Foundation upon the Canadian National Committee for Mental Hygiene to be devoted to research studies among school children for the purpose of detecting and remedying the causes of insanity, calls attention both to the wonderful advances made by the medical profession and the changed attitude on the part of the public regarding mental disorders. The gift is conditional upon a similar amount being subscribed from home sources in the Dominion. This fund will be devoted to a study of school children. The main work will be carried on in Toronto and Montreal. In addition to the mere examination and segregation of defective children, nurses and teachers and others having to deal with children will receive a course of training. Investigations will also be carried on at Shawbridge Boys' Home, the Juvenile Court and other institutions.''

Dr. C. Regaud, director of the research work carried on in the Radium Institute, Paris, delivered a course of lectures in Montreal on the therapeutic action of radium in Quebec and Montreal. Dr. Regaud was brought here at the request of the Quebec Government and Dr. J. E. Gendreau of Montreal, director of the Radium Institute of the Province of Quebec, met him at Quebec and accompanied him to Montreal.

McGill University at Convocation, May 30th, graduated the record number of 465 students and conferred honorary degrees upon two literary representatives of the two great English-speaking nations. Dr. Lawrence Pearsall-Jacks, editor of the *Hibbert Journal* and Principal of Manchester College, Oxford, who delivered the address to the students, and George Horace Lorimer, editor-in-chief of the *Saturday Evening Post*. Dr. Jacks is a member of the Phi Beta Kappa Society, the highest honorary scholastic fraternity in the world.

The announcement comes from McGill University of two important appointments in the Department of Medicine—Professor Jonathan C. Meakins as Professor of Medicine and Director of the Department, as also head of the university clinic at the Royal Victoria Hospital; and Professor Campbell P. Howard of Iowa University as Professor of Medicine and Physician to the Montreal General Hospital.

It is interesting to note that both of these Chairs are being filled by graduates of McGill.

Dr. J. C. Meakins graduated in medicine in 1904, and after spending some years as resident physician in the Royal Victoria Hospital, Montreal, and at Johns Hopkins Hospital, Baltimore, he was called to the Presbyterian Hospital, New York, as resident pathologist.

In 1909, he returned to McGill University, becoming a lecturer in clinical medicine and assistant physician to the Royal Victoria Hospital. In 1913-14 he studied under Sir James Mackenzie and Sir Thomas Lewis, specializing in some extent in diseases of the heart. In 1915, he went overseas with No. 3 McGill General Hospital, remaining on military service until November, 1918, when he returned to Montreal. During his overseas medical service, he became conspicuous on account of his research work in connection with the soldier's heart, and his laboratory investigations on the effects of gas poisoning. The British Government, recognizing his brilliancy in this connection, appointed him to the Chemical Warfare Committee, and later, he became a member of the Inter-Allied Chemical Warfare Conferences.

His stay in Montreal after the war was of short duration, for in October, 1919, he was appointed Christison Professor of Therapeutics and Professor of Clinical Medicine in Edinburgh University, an honour the type of which is given to few Canadians.

In the same year he was appointed attending physician to the Royal Infirmary, Edinburgh, and later was elected a Fellow of the Royal College of Physicians.

His years in Edinburgh have been conspicuous by their brilliancy, and recent communications from their university attest to their appreciation of the serious loss which his return to Montreal will entail. His career in Edinburgh has been marked by much productive work in medical research, and by an appreciation of his ability as a consulting physician to the infirmary. He was elected a Fellow of the Royal Society of Edinburgh in 1920, and held several other important positions in connection with medical institutions in Scotland.

McGill may justly feel proud of his success in Great Britain, and still more proud of being able to recall him to her own school.

Dr. Campbell Palmer Howard is likewise a graduate of McGill. In 1901 he became an interne in medicine at the Montreal General Hospital, and subsequently for several years at Johns Hopkins Hospital, Baltimore. He returned to Montreal in 1907 to the practice of his profession and as a teacher in the medical school. So successful were his efforts at McGill that he was called in 1910 to the Chair of Theory and Practice of Medicine in the State University of Iowa, and appointed physician to the university hospital.

At the outbreak of war, he returned to Montreal in order to prepare for service with No. 3 McGill General Hospital, where he remained during several years.

Dr. Howard has been conspicuous in the United States as a teacher of clinical medicine, as an organizer and as a consultant. Returning to his old home as physician-in-chief to the General Hospital, he will receive a hearty welcome from his colleagues, and will add in a most distinctive manner to the success of the medical school at McGill.

ONTARIO

On April 25th, the North Waterloo Medical Society were addressed at Kitchener by Dr. J. P. Morton on the subject, ''The Nasal Sinuses; their Anatomy and Diseases.''

Dr. F. A. Clarkson of Toronto, addressed the Norfolk County Medical Society on April 29th, on ''The Diagnosis and Treatment of Coma.''

Dr. Boyer of Toronto conducted a clinic at a meeting of the Hamilton Medical Society on May 1st, on ''Organic Nervous Diseases in Children.''

The St. Thomas Medical Society met on May 2nd; Dr. J. K. McGregor of Hamilton gave an address on ''Treatment, Surgical and Non-Surgical, of Goitre.''

At a meeting of the Brant County Medical Society in Brantford on May 8th, Dr. W. T. Connell gave an address on ''Pernicious and other Grave Anaemias.''

The Grey County Medical Society met in Markdale on May 9th; addresses were given by Dr. J. H. Elliott, on "Non-Tuberculous Pulmonary Disease;" and by Dr. Geo. E. Wilson, "Fractures."

Dr. Geo. Strathy of Toronto addressed the Ontario County Medical Society at Whitby on May 14th, his subject being, "Common Types of Indigestion and their Treatment."

Dr. J. Hunt of the Provincial Board of Health, addressed a meeting of the Hastings County Medical Society on May 14th, in Belleville, his subject being "Venereal Diseases."

The South Waterloo Society met in Ayr on May 15th; addresses were given by Dr. Geo. E. Wilson, on "The Treatment of Fractures," and by Dr. Wm. Goldie, on "Hypertension and its relation to Vascular Function."

At a meeting of the Barrie Medical Society on May 15th, Dr. F. W. Rolph gave an address on "The Interpretation of the Signs and Symptoms of Chronic Gastro-Intestinal Disease."

The Welland County Medical Society met at Welland on May 20th; an address was given by Dr. G. W. Mylks of Kingston on "Pyelitis of Pregnancy."

Dr. Leonard Murray of Toronto addressed the Oxford County Medical Society at Woodstock on May 21st, his subject being, "Rheumatic Fever and Endocarditis."

The Health Bulletin for February and March, Department of Public Health, Toronto, consists of excellent "catechisms" of mental hygiene or hygiene of the brain and nervous system, and of the nutritional problem. The excellence of these publications issued by Dr. Hasting's department of public health is apparent to any physician who takes the trouble to glance through them. The important feature of many daily problems are clearly set out in an interesting way, and should be of the greatest assistance to the physician in general practice.

The North Waterloo Medical Society met at Kitchener on May 23rd. An address was given by Dr. Geo. A. Ramsay of London, on "The Hand—Relation of its Anatomy to Infections."

On May 27th, Dr. E. E. Cleaver of Toronto, addressed the Lincoln County Medical Society at St. Catharines, on "The Etiology, Diagnosis and Medical Treatment of Gastric and Duodenal Ulcer."

Dr. J. K. McGregor of Hamilton addressed the Huron County Medical Society on May 28th, in Wingham, his subject being "The Differential Diagnosis and Treatment of Goitre."

The Northumberland and Durham Medical Society met at Cobourg on May 28th; Dr. G. W. Ross of Toronto gave an address on "The Diagnosis and Treatment of the Common Skin Affections."

Dr. John Oille addressed a meeting of the Renfrew County Medical Society on May 29th, his subject being "The Diagnosis, Prognosis and Treatment of Cardiac Irregularities."

On June 4th, the Wellington County Medical Society met at Palmerston and the following addresses were given:—Dr. H. S. Hutchison, "The Modern Treatment of Nephritis"; Dr. E. J. Trow, "The Diagnosis and Treatment of the Common Skin Affections."

The Sudbury Medical Society met on June 4th; Dr. J. K. McGregor of Hamilton gave an address on "Treatment, Surgical and Non-Surgical, of Goitre."

MANITOBA

The Sectional Meeting of the American College of Surgeons for Manitoba, North Dakota, Minnesota, Saskatchewan, and Alberta will be held in Winnipeg, Manitoba, on the 2nd and 3rd of September. Headquarters and registration will be at the Fort Garry Hotel.

A very large attendance is expected and an attractive programme is being prepared.

The Southern Manitoba District Medical Society was organized at Morden on May 30th, with the following officers:—President, Dr. H. C. Cunningham, Carman; Vice-President, Dr. R. D. Ferguson, Pilot Mound; Sec.-Treas., Dr. A. F. Menzies, Morden; Executive, Dr. H. McGavin, Plum Coulee; Dr. T. R. Corbett, Crystal City.

The new officers of the Winnipeg Medical Society are:—President, Dr. F. D. McKenty; Vice-President, Dr. J. D. McEachern; Treasurer, Dr. D. C. Aitkenhead; Secretary, Dr. Lennox Arthur; Trustee, Dr. W. L. Mann.

BRITISH COLUMBIA

The Vancouver Medical Association contemplates the issue of a monthly bulletin for the purpose of keeping its members informed of the propesed work of the Association, and for the publication of selected papers presented before the Society. It is expected that the first number will be issued in September and will contain the programme for the ensuing winter session.

The chiropractor is still with us, and judging by the results of the post-mortem examination at an inquest held recently on a case of acute appendicitis, with abscess, he can hardly be called useful in cases of this kind.

Dr. R. H. Mullin, Chief of Laboratories of the Vancouver General Hospital, is now in the east obtaining data for the proposed Infectious Diseases Hospital in Vancouver. The question of caring for infectious diseases has become a serious problem for Vancouver and vicinity, owing to the rapidly increasing population. That a large institution, capable of serving the needs, not only of Vancouver proper, but of the

surrounding districts will have to be erected, under the control of a commission, is inevitable, as the present buildings attached to the Vancouver General Hospital have shown themselves entirely inadequate to cope with the prevalence of diphtheria and scarlet fever during the last year. The whole problem of hospital accommodation is becoming acute and a committee of the staff of the hospital has been formed to enquire into the best methods of providing accommodation for the future.

Graduation exercises of the Nurses Training School, attached to the Vancouver General Hospital, were held on the 4th instant, in the auditorium of King Edward High School. Eighty graduates and affiliates received their diplomas and pins at the hands of Mr. R. R. Burns, Chairman of the Board of Governors, and Miss Ellis, Lady Superintendent of the Training School. The hall was well filled. Speeches were delivered by Dr. G. H. Worthington (medical representative on the Vancouver Council) and Dr. R. E. McKechnie, Chancellor of the University of British Columbia. After the ceremonies a reception was held in the hospital grounds.

The examinations of the medical council at Vancouver Centre are now in progress. Abaut twenty candidates are applying for registration in the province.

Arrangements are well in hand for the annual meeting of the B. C. Medical Association which will be held in Vancouver on June 25th. There is to be a luncheon on that date, when an address will be given by Dr. Frederic J. Cotton, of Boston, on "Industrial Surgery, including Reconstruction Methods." At the evening session, an address will be given by Dr. S. A. Kinnier Wilson, the famous neurologist, who, with Dr. Cotton, is among the speakers at the Pacific Northwest Medical Association convention, whose sessions start on June 26th. It is confidently expected that there will be a very large attendance at the luncheon and meeting.

The Executive-Secretary's office has been able to give very valuable service as an information bureau; it also provides a locum-tenens for any medical man requiring one. It is the aim to keep, constantly on hand, a list of men who are willing to act as locum tenens, and hitherto, there has been no difficulty in supplying these where they were required.

The Association maintains a very close contact with the Canadian Medical Association, and furnishes a monthly news column to the C.M.A. *Journal*. The two Associations are able to keep closely in touch, and much of value has resulted from this relationship. It is hoped that the fees of the combined Associations may be somewhat reduced during the coming year.

An old dispute has cropped up in Natal and Michel, between the medical man there and the mining company. We understand from the former, that the mining company has treated him unfairly, and that it is advertising for a new doctor. We are in correspondence with him to obtain full details, but would urge all medical men to refrain from answering any such advertisement without communicating with the head office of the Association.

During the coming year the question of health insurance will probably become active. It may be noted that certain Boards of Trade in the Province have taken this matter up. Labor is intensely interested in the subject and our Association is keenly alive to the necessity for education, both in the medical profession and the public, along proper lines, with regard to this important subject. Every member is urged to take an interest in this matter and to hold himself ready to express his opinions and views when this may be made possible. A committee has been appointed by the executive to confer with various other sections of the community with a view to obtaining their views on the subject, and imparting our own. While the Association has not, so far, taken any definite stand on this subject, there is very little doubt that the time is close at hand, when it will be necessary for us to do so, and the closest unity is necessary if we are to escape the danger of exploitation and unwise legislation.

A short general account of the activities of the Association will be of interest to the profession. Our membership has increased from 121 in August, 1921, to a present membership of over 400. The first years of the Association, since its reorganization, have been beset by many difficulties and trials. The medical profession is notoriously difficult to organize, and the Association has experienced to the full, the disadvantages of this fact, but there is evidence of an increasing tendency amongst the medical men of this province, and indeed of every province in Canada, towards unity. There can be no question of the absolute necessity for co-operation and unity. Every day of the year our business office is in contact with medical men who need help and support, and even as far as we have gone, notwithstanding all the difficulties incident on apathy and lack of union, this Association has been able to render very valuable help, both individually and collectively, to members of our profession in this province.

As time goes by, and we learn to work more effectively together, there is no doubt that membership in this Association will be an absolute necessity to all medical men residing in the province. This is realized fully now, by the medical men practising outside of the big centres, where our provincial Association is the only organization to which they can belong, with any hope of practical advantage. In these outlying districts, our membership embraces very nearly 100% of the resident practitioners.

A Blood Pressure Paradox.—Albert H. Miller, Providence, R.I., reports the case of an apparently healthy young man who had a normal systolic blood pressure, but no diastolic pressure. The diastolic pressure, taken by an approved auscultatory method, registered zero. It is pointed out that in certain blood pressure examinations, the fourth phase may extend down the scale to zero, resulting in the entire absence of the fifth phase. In these cases, observers who note the diastolic pressure at the fifth phase find the diastolic pressure at zero and are mystified by the occurrence of the blood pressure paradox. The diastolic pressure should be noted at the beginning of the fourth rather than the fifth phase. The blood pressure paradox occurs with hyperthyroidism, aortic heart lesions, fracture of the skull, and during general anaesthesia. It may be continuous or may occur intermittently. The occurrence of the blood pressure paradox does not seem to influence recovery.—*Jour. Am. Med. Assoc.* May 10, 1924.

The Association

THE LISTER MEMORIAL FUND

Reference was made to the foundation of this fund in the June issue of the *Journal*. The inaugural oration was delivered at the annual meeting in Ottawa on Wednesday evening, June 18th before a large and appreciative audience of members, their friends and invited guests, the speaker being Dr. John Stewart of Halifax, a former student and assistant of Lister.

Among those present were His Excellency Lord Byng of Vimy, Governor General of Canada; Sir Jenner Verrall and Dr. Cox, official delegates from the British Medical Association; Sir John Thomson-Walker, Dr. John Parkinson, Dr. Elliott P. Joslin, Dr. Joseph H. Pratt, Dr. J. Osborn Polack, Dr. Gordon Wilson, Dr. C. W. Waldron, Dr. J. Canfield Dwyer, Dr. J. F. Kidd, President of the Canadian Medical Association; Dr. J. F. Argue, President of the Ontario Medical Association, and members of the Council of the Canadian Medical Association.

Three years must now elapse before another Listerian Oration. It is not the purpose of the Association to confine these triennial orations to the subject of Lister and his work; rather it is the idea to perpetuate the memory of Lister by a fund bearing his name, the proceeds of which should be devoted to the advancement of medical knowledge, an aim which would meet with the desires of the master surgeon himself.

The more rapidly the fund can be raised and the sooner invested, the more promptly can arrangements be made for the next oration as the Executive will know definitely what interest will have accumulated at the end of three years and what will be available for expenditure.

The sum considered necessary is $5,000.00, the interest on which will in three years approximate $750.00. Contributors will constitute the "Lister Club."

The trustee of the fund is Dr. F. N. G. Starr, 112 College St., Toronto, to whom cheques should be sent.

This first Lister Memorial Oration by Dr. Stewart, and the business transactions of the annual meeting of the Association will be published in a special issue. A copy will be sent free to all members of the Association. For non-members the issue will be placed on sale at 50 cents per copy.

Digestive Albuminuria. — A. Cade and P. Ravault (*Journ. de Méd. de Lyon*, January 20th, 1924, p. 35) draw attention to the important fact that many cases of albuminuria are not of renal origin, but are due to lesions of the alimentary canal or to errors in diet—for example, an excessive ingestion of eggs may produce a transient albuminuria, apparently due to excess of egg-albumin appearing in the blood plasma. The term "digestive albuminuria" should be reserved strictly to denote functional, curable albuminuria, definitely related to the state of the digestive organs or of the liver, and unaccompanied by casts or by any other sign of renal disease. At the same time it is to be remembered that gastro-intestinal or hepatic diseases may produce a true secondary nephritis. Digestive albuminuria is often, though not invariably, intermittent; when it follows the ingestion of food it may be of the "orthostatic" type. Very frequently in hepatic disease globulinuria is present and may be differentiated from other forms of albuminuria by its solubility in dilute acetic acid. "Gastric albuminuria," due to functional dyspepsia, gastric dilatation, gastroptosis, etc., should be distinguished from the rarer albuminuria resulting from intestinal diseases, and also from "hepatogenous" albuminuria associated with derangements of the functions of the liver. The etiology of many of these cases is obscure; some are due to the ingestion of heterogenous proteins, to gastro-intestinal toxaemia, or to functional or organic liver disease.—*Brit. Med. Jour.*, June 7, 1924.

Investments

Your wants never cease, but your earning power will.

Your need for an independent income is essential during the latter years of your life; and, after you have passed on, there is the need of an income for your dependents. Every man is faced with this problem. Some solve it in one way, some in another, some never solve it. It is a matter which should be met fairly by each individual. But how?

We believe that each individual should budget his expenses and conduct his affairs in the same manner as does a business house. That earned income should be treated as profits; provision be made so that there is a surplus over expense; and that the surplus be handled on a definite savings plan with a view to securing a well proportioned invested fund.

There are three main mediums of investment—Improved Real Estate—Securities—and Life Insurance. Of these three, properly selected securities are, we believe, the most suitable for the average man having a limited amount of time to devote to the care of his investments. Insurance is good, but more for the protection of dependents than for an investment fund. While speaking of insurance policies—the security back of the policies is well selected diversified securities. Real Estate requires a great deal of time to administer, and also has not the ready market that good securities have. For the purpose of an investment fund providing an independent income, good bonds, taking all things into consideration, are the best medium.

Before going into the different classes of bonds it is advisable to know just what can be accomplished by a systematic saving plan. The individual should decide in his own mind what amount he desires to save, and when. By allowing the laws of compound interest to work for him, surprising results are obtained.

The following table shows in round figures how a savings fund grows following a systematic plan of purchasing bonds to yield 6% and by compounding the interest received.

No. Years	$3 *per Week*	$5 *per Week*	$10 *per Week*	$25 *per Week*
1	160	265	530	1,325
2	325	545	1,095	2,736
3	505	840	1,690	4,230
5	890	1,490	2,995	7,500
8	1,570	2,625	5,270	13,180
10	2,090	3,505	7,025	17,570
15	3,070	6,210	12,440	31,112
20	5,870	9,840	19,715	49,310

Diversification is the prime essential necessary for the scientific investment of any given fund. This applies just as much to the investment of $500 as it does to $500,000. The greater the diversity the better. It is upon this principle that the vast sums invested by such institutions as insurance companies is based.

A few years ago it was more difficult than it is to-day to properly diversify investment holdings. With the advent of the $100 bond, the man of smaller means is enabled to pick and choose in the same manner as is a large investment institution.

BOND ISSUES

There are three main divisions in the ranks of bond issues—First, Governments, Provinces or Municipalities; Second, Hydro-Electric and Public Utility Companies; Third, Industrial Companies. A properly diversified fund would include a percentage of each class. Generally speaking those of the first class are the strongest. They are not secured by the pledge of definite assets, but are secured by the "promise to pay" of the issuing community or government. Their security is based upon the fact that the ratepaying (or taxpaying) public are responsible for them. Care should be taken when securing bonds of this class to purchase those of a community whose affairs are properly administered, for where defaults have occurred it is a most difficult matter to enforce payment.

Hydro-Electric and Public Utility Bonds are rapidly becoming more popular, and are closely pressing the Municipal Bond for first place. The nature of the Public Utility business is such that the demand for their products fluctuates very slightly with changing conditions. This is especially true of Water Power Companies for they serve a diversity of interests—a reduction by one customer is usually made up by an increase by another. Bonds of such companies constitute in themselves a diversified investment. It is a noteworthy fact that there has never been a loss either of principal or interest in the first mortgage bonds of Canadian Water Power Companies. The Bonds of some of the older established companies of this class sell on approximately the same interest basis as the Bonds of our Dominion Government, but as a general rule a higher yield is obtainable than from the average municipal bond.

Bonds of industrial companies give the greatest income return and generally speaking are more speculative than those of either of the above classes. There are of course some long established companies in this class whose securities have the highest investment qualifications, but it requires more care and experience to choose the best ones than is required to secure safety in other classes of securities. The main essentials of safety in this class are:—first, efficient management, and second, that the company manufactures an essential product.

While we have placed these classes in order of safety, it does not follow that by buying any bond in the first class the investment is safer than it would be in the second or third classes—for there are quite a few industrial securities that are much better than some municipal bonds, and some Water Power Bonds are stronger than very many municipal bonds.

Each class has its own peculiarities, and its own pitfalls. For proper diversity, and to assure a fair yield with safety, a fund should be divided into portions—so much in one class, so much in another. It is advisable before acting, to consult an investment banking house of established reputation and experience, for by reason of their experience, it is possible for them to assist you in making the most of your fund by securing for you the greatest interest return with safety.

Members are invited to write to the General-Secretary, Dr. T. C. Routley, 184 College St., Toronto, for information or advice regarding investments.

Inquiries will be entirely confidential, and answers will be based upon information believed to be reliable, fair and unprejudiced.

Book Reviews

The Chemical Basis of Growth and Senescence. By T. Brailsford Robertson, in Monographs on Experimental Biology. Pp. viii + 389. J. B. Lippincott Co., Montreal, 1924.

The hypothesis by which the author interprets the fundamental principles of growth, was first suggested in 1908 by himself, and almost simultaneously by Wolfgang Ostwald.

The chemical basis of growth and senescence on this hypothesis in an autocatalysed reaction, i.e. a reaction in which the end products at first accelerate and later retard, the course of the reaction which produced them. The author presents this conception as "a preliminary essay—toward an interpretation of growth—based upon certain chemical processes of development." From it derives the features of the life cycles in all living matters. the early acceleration, the intermediate stasis, the succeeding retardation and the inevitable cessation in death.

The hypothesis is simple, remarkably flexible, and capable of wide spread and fruitful application. Its validity is substantiated by the close approximation of statistical and experimental data to results predicted by calculations based on the mathematical formula for the autocatalytic reaction. The statistical and experimental data are obtained from such vastly different systems as a colony of unicellular organisms, plants, herbivora, and other mammals, including man.

The common functional unit is the cell whose differentiating characteristic is the ratio of nucleus to cytoplasm. To the variations in this ratio, in its continued diminution with increasing age, the author assigns the origin of physiological differentiation and development.

Senescence is shown to be the "necessary outcome of differentiation" and is due to the fact that differentiation inhibits nuclear synthesis in less differentiated cells and thus renders cell division impossible." Results discussed "support the view that the relative longevity of man is due to the comparative abundance of undifferentiated tissue which enters into his composition."

The author employs, with great dexterity, evidence drawn largely from experiments on unicellular organisms, This striking ingenuity, everywhere manifest, constitutes in a sense, an important defect of the work. One feels that the author permits his ingenuity to carry him somewhat farther than is justified by the experimental facts. But if this is a defect it is one readily forgiven. It imparts to a great mass of disconnected data a unifying theme of deep significance. It stimulates an optimism in the ultimate success of the scientific investigation of the phenomenon of life which as the author indicates in the preface, is, strangely necessary though we cannot help feeling that he overrates the significance in modern thought of such works as those of Bergson.

Several chapters of the book are useful in themselves aside from their rôle in the author's thesis. The summaries of our knowledge of the principles of nutrition and of the vitamines are presented in a fresh and novel manner. Pathological conditions, cancer, regeneration, the hormones, are reviewed and analyzed and receive a general as well as a specific interpretation. The appendix contains methods and tables for the computation of curves of autocatalysis.

The book presents a capable summing up of the present status of experimental biology. It is a good book and, like other books from the same author, it is full of inspiration. H. W.

Cyanosis. By Christian Lundsgaard and Donald D. Van Slyke, The Rockefeller Institute for Medical Research. Cloth, 82 pages, 6 x 9 with 20 diagrams and illustrations. Price $2.00. Williams and Wilkins Company, Baltimore, 1922.

This forms the second volume of monographs reprinted from *Medicine*, a quarterly journal devoted to monographs on medicine, each of which reviews our present knowledge of the subject discussed. Volume one was on the therapeutic use of digitalis. The present volume is an analysis and interpretation of the facts which have accumulated bearing upon the conception of cyanosis. Both recent physiological researches and the historical viewpoints are considered, with many references to bed-side observations recorded in the literature. These have reference more particularly to cyanosis as observed in pulmonary and cardiac disease, but also refer to the condition in general anaesthesia, in the newborn, in anaemia, polycythaemia and acrocyanosis.

On the basis of Lundsgaard's demonstration that the cause of cyanosis is an abnormally large amount of reduced haemoglobin in the capillary blood, the quantitative effects of four factors contributing to this cause have been estimated, viz, (1) the total haemoglobin content; (2) the degree of oxygen unsaturation of the arterial blood coming from aerated lung areas; (3) the proportion of blood passing from right heart to left through unaerated channels, and (4) the oxygen consumption in the capillaries.

In the bibliography which is a valuable feature of the work are numerous references to publications of Dr. Maude Abbott and Prof. J. C. Meakins. The monograph will be welcomed by physiologists and physicians especially those interested in clinical investigations.

J. H. E.

Modern Urology, in original contributions by American authors. Edited by Hugh Cabot, M.D., C.M.G., F.A.C.S., Dean and Professor of Surgery in the Medical School of the University of Michigan, Ann Arbor, Michigan. Two octavo volumes, totalling 1572 pages with 686 engravings and 19 plates. Cloth, per set, $18.00 net. Lea and Febiger, Philadelphia and New York, 1924. Second Edition, thoroughly revised.

Vol. II.—Diseases of the Bladder, Diseases of the Ureter, Diseases of the Kidney. 774 pages, illustrated with 288 engravings and 8 plates.

This volume is constructed on the same general plan as in the first edition, and is written by the same authors, but contains some 36 additional pages and 20 additional illustrations.

The chapter on "Malformations and Diverticulum of the Bladder" by William E. Lower, M.D., is amplified by a complete discussion of the technique and results of implantation of the ureter into the intestine, while some minor changes have been made in the section dealing with diverticula.

The chapter on the Anatomy, Abnormalities, Injuries and Diseases of the Ureter by Guy L. Hunner, M.D., has been rewritten, and includes a very full reference (43 pages) to Ureteral Stricture. Until recent years the literature on ureteral stricture has represented this lesion as being very rare, and chiefly of congenital origin, but the writer believes that it is one of the most common lesions within the abdomen, is due to simple chronic inflammatory infiltration of the ureteral walls, which may be due to fecal infection, that it is to be diagnosed by the wax bulb and pyelo-

uretero-gram, and that the ideal treatment is by dilatation from the vesical approach.

This volume maintains the high standard of the first edition, and may well be said to afford a clear exposition of "Modern" Urology. E. R. S.

Diathermy and its Application to Pneumonia. By Harry Eaton Stewart, M.D. 12 mo. Cloth $3.00 net. 210 pages, illustrated. Published by Paul B. Hoeber, New York City.

The final opinion as to the value of this new application of an old and greatly valued method of physiotherapy in the treatment of pneumonia will depend to a large extent upon a thorough appreciation of exactly what is claimed for it as a therapeutic measure in this disease. Fortunately the author makes some very clear and definite statements on this point. "The length of the period of illness does not seem to be shortened nor have we prevented relapse, but in 97% of the cases the temperature started down immediately by lysis. The saving of the body's vital forces by shortening the period of sustained high temperature must be obvious." This is coupled with the equally important statement "It can be stated positively that with the proper technique no harm can be done the patient." The whole question then seems to rest upon a study of the character of the clinical results obtained. Early application of the treatment is as important as early operation in appendicitis. "Not a single case of pneumonia has been lost in which the treatment has been started before the third day."

The statements are sufficiently arresting to demand an examination of the material upon which they were founded. The average mortality in pneumonia in young adults (20 years) is stated to be 20% and this increases at about the rate of 10% per decade so that at the age of 35 the rate is 35%. In a series of 21 control cases in hospital, 9 died, or 42.9% mortality. These cases were unselected and were treated by the most approved known methods, but did not receive diathermy. At the same time and in the same institution in 36 unselected cases treated by diathermy only 7 died or 19.4%.

As the author concludes "it is difficult to see how this reduction in mortality can be explained upon any other basis than that of the effect of diathermy in this disease." G. E. R.

Physiotherapy Technic. By C. M. Sampson. 443 pages with 85 illustrations. Price $6.50. Published by C. V. Mosby Company, St. Louis, U.S.A.

This manual is based largely upon the experience gained by the author while in charge of the physiotherapy departments of a number of large army hospitals of the U.S. army during the war and the reconstruction work following it. In this position the author enjoyed a unique opportunity to properly test out a variety of physical agents in almost every conceivable form of injury or disease in which physiotherapy is thought to be of value. The result has been to make it possible to give specific directions as to the best technic to follow in certain forms of physiotherapy and the outstanding feature of the book is the exact and practical nature of the instructions laid down. It is obviously the work of an enthusiast and is full of the most dogmatic statements, many of which are immediately backed up by such a mass of evidence that one feels the enthusiasm is for the most part justified.

If any one chapter were to be singled out for special mention it would almost certainly be that dealing with diathermy. This is very full, practical and specific. Anyone who has failed up to the present to see good results from diathermy should read this chapter and then try again before giving voice to his skepticism. The section on the treatment of peripheral nerve injuries is equally good. In fact the books stands, in the opinion of this reviewer, as the best exposition of physiotherapeutic technique and practice at present available. It would be to the very great benefit of the profession if such a book were read more generally and some of the teaching tried out instead of being sneered at without a trial as is so often the case at present. G. E. R.

Outline of Ultra-Violet Therapy—Second edition. By A. J. Pacini, M.D. 204 pages, illustrated. Published by Poole Bros., Chicago, 1923.

A full description of the construction of the various types of mercury vapour quartz lights is given, including both air cooled and water cooled lamps with precise instructions for the operation and care of both. This is accompanied by a simple *résumé* of the essential physical facts regarding the spectrum and includes tables showing the relative wave lengths of all therapeutic radiations from the infra-red through the visible spectrum down to the very short waves of x-rays and radium. A knowledge of these facts is essential to anyone undertaking radiation therapy intelligently.

The physiological effects following exposure to ultra-violet light consist in (1) hyperaemia, followed shortly by (2) erythema, and the therapeutic results are largely due to either one or both of these effects. The remainder of the book is taken up with a discussion of the various diseases or conditions is which ultra-violet light is of value with specific directions for the treatment of each.

So long as this book is read with a fair degree of conservatism it will prove of the greatest value as an outline of a subject which has hitherto depended too much upon the propagandist literature of manufacturers and non-medical agents. G. E. R.

Venereal Disease, its Prevention, Symptoms and Treatment. By Hugh Wansey Bayly, M.C. Large 8vo, pp. xvi + 176, 58 illustrations. Second edition. Price $2.25. Toronto, The MacMillan Company of Canada, 1924.

The author is the secretary of the Society for the Prevention of Venereal Disease, and has had wide personal experience as pathologist to the London lock hospitals and as medical officer to the venereal department of St. George's Hospital and to large military hospitals. The preface contains a statement of the different points of view and policy held by his society and by the National Council for Combating Venereal Disease. He is a firm believer in the efficacy of teaching methods of immediate self-disinfection, and in the wisdom of permitting properly qualified chemists to sell approved "packets."

He has succeeded in placing the essentials for the prevention, diagnosis and treatment of venereal disease in a concise yet clear and simple form. The work is divided into five sections. The first deals with prevention, under the headings of education, legislation, protection, prophylaxis and disinfection. Syphilis, gonorrhoea and the non-specific lesions are each given a chapter. The final chapter deals with the consulting room, home treatment, history records, methods of routine examination and specimen taking, with short summaries of the subjects of marriage and sterility. His remarks on the value of the Wassermann reaction appear to be safe, sane and sound. He believes that without an appreciation of its limitations it may be become discredited.

This is a small handbook which should be welcomed by the physician who wishes to know what is latest and best in effective treatment of venereal disease. J. H. E.

A Study of Masturbation and its Reported Sequelae. By John F. W. Meagher, M.D., F.A.C.P., Neurologist to St. Mary's Hospital, Brooklyn, N.Y. Small 8vo, 69 pp. Price $1.50. New York, William Wood & Company, 1924.

The writer attempts to present concisely the essen-

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tial features of this subject. He has succeeded in making a presentation which may fairly be said to reflect modern medical thought. It is written not only for the physician but for others interested in the psychological and sociological aspects of the topic. He has reviewed a very extensive literature to get the opinion of previous writers. He ascribes much of the misinformation of the public upon the subject to the pessimistic and misleading writings of Tissot, Lallemand, Voltaire and others published from 1760 to 1890, and gives credit to modern writers for separating facts from fancies in regard to the habit and its effect. The book is dedicated to Ernest Jones. J. H. E.

Colonic Therapy in the Treatment of Disease. By O. Boto Schellberg. Large 8vo of 202 pages with 28 ful page plates. New York, American Institute of Medicine, Inc. 1923.

Schellberg's colonic therapy was the subject of a paper in the *New York Medical Journal* in 1921, and he has made recent contributions to the *International Journal of Medicine and Surgery*. After discussing the evolution of the alimentary canal, its bacteriology, anatomy and physiology and the relation of colonic pathology to systemic infection, he deals with the futile enema and describes his technique of colonic irrigation with its special applications. Specific mention is made of this therapy in atony, faecal impaction following milk diet, arthritis, spastic colon, and in colonic angulations and flexures. Diet, dress and habits are also discussed. J. H. E.

International Clinics. Thirty-fourth series, Volume 1, 1924. Edited by Henry W. Cattell, A. M., M.D., Philadelphia, U.S.A., with medical and surgical collaborators in United States, England and Canada. Price $2.50 per volume or $10.00 for the series of four. J. B. Lippincott Company, Montreal, Quebec.

The first volume of the present series is one of general interest. The clinical lectures include exophthalmic goitre by L. F. Barker, heart disease in children by J. P. C. Griffith, and haemorrhagic purpura by N. E. Brill. There is a symposium upon the diseases and accidents in the newly born baby, six general papers on diagnosis and treatment and two on rectal diseases and their treatment. The department of industrial medicine which has become a valuable one in the Clinics has two excellent papers, and J. E. Sweet's "Mutter Lecture" on the gall-bladder is reproduced in full. Seventy-five pages are devoted to a retrospect of the medical literature of 1923 in which the more important contributions of the year are noticed and summarized. This retrospect which is now an annual feature gives the busy physician an opportunity to become acquainted with the progress in the various departments of medicine. J. H. E.

Digestive Disturbances in Infants and Children. By Charles Gilmore Kerley, M.D., and Leon Theodore LeWald, M.D. with a note on the surgery of infants by William A. Downes, M.D. 117 roentgen ray studies on 54 full page plates, and 49 text illustrations. Price $12.00. Published by Paul B. Hoeber, New York City, 1923.

This atlas contains an immense amount of extremely useful material for the paediatric and x-ray specialist. The subject matter is divided into two parts, first, the text; second, the atlas. The text contains an excellent description of the x-ray technique as applied to children while there exists a very lucid explanation of the plates contained in the atlas.

The most important subjects considered in this work are atresia of the oesphagus, chronic dilatation of the stomach, dilatation and ptosis of the large bowel, influence of posture on digestion, diaphragmatic hernia, abdominal tumours and foreign bodies in the alimentary tract.

The x-ray pictures are clear, well illustrated and carefully marked. A. B.

Books Received

A Study of Masturbation and it Reputed Sequelae—By John F. W. Meagher, M.D., F.A.C.P. 63 pages. Price $1.50. Published by Messrs. William Wood & Company, New York.

Cosmetic Surgery—By Charles Conrad Miller, M.D. 263 pages with 140 illustrations. Price $4.00 net. Published by F. A. Davis Company, Philadelphia.

Diseases of Middle Life—By Frank A. Craig, M.D. Volumes I and II. 934 pages in Volume I and 903 pages in Volume II. Illustrated. Price $15.00 net. Published by F. A. Davis Company, Philadelphia.

Transactions of the American Surgical Association—Vol. XLI. Edited by John H. Jopson, M.D. For sale by William J. Dornan, Philadelphia, Pa.

Science and Art of Anaesthesia—By Colonel William Webster, D.S.O., M.D., C.M. 206 pages, illustrated. Published by The C. V. Mosby Company, St. Louis, U.S.A.

Official History of the War—Medical Services, General History, Vol. III.—By Major-General Sir W. G. Macpherson, K.C.M.G., C.B., LL.D. 556 pages, illustrated. Price £1 1s. Published by His Majesty's Stationery Office, London, Eng.

Modern Urology—By Hugh Cabot, M.D., C.M.G., F.A.C.S. Vol. 1. 828 pages, illustrated with 389 engravings and 11 plates. Price $18.00. Published by Lea & Febiger, Philadelphia and New York.

Treatment of Common Orders of Digestion—By John L. Kantor, Ph.D., M.D. 245 pages, illustrated. Published by The C. V. Mosby Company, St. Louis, U.S.A.

Pharmacology and Therapeutics or the Action of Drugs in Health and Disease—By Arthur R. Cushny, M.A., M.D., LL.D., F.R.S. Eighth edition. 707 pages, illustrated with 73 engravings. Price $6.00. Published by Lea & Febiger, Philadelphia and New York.

The Surgical Clinics of North America—(Mayo Clinic Number—April, 1924). Volume IV, Number II. 295 pages with 88 illustrations. Per Clinic year (February, 1924 to December, 1924). Paper $12.00; Cloth $16.00 net. Published by W. B. Saunders Company, Philadelphia and London. Toronto Agents—The J. F. Hartz Company.

Crime and Insanity—By W. C. Sullivan, M.D. 256 pages, illustrated. Price 12s 6d net. Published by Messrs. Edward Arnold & Co., London, England.

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Samples and Literature; **J. I. EDDÉ,** New Birks Bldg., Montreal.

Proceedings of the Royal Society of Medicine—Edited by Sir John Y. W. MacAlister under the direction of the Editorial Committee. Vol. XVII, No. 7. Published by Longmans, Green & Co., 39 Paternoster Row, London.

The Operating Room—Instructions for Nurses and Assistants. 165 pages with 144 illustrations. Price $1.75 net. Published by W. B. Saunders Company, Philadelphia. Toronto Agents—The J. F. Hartz Company.

Differential Diagnosis—Vol. II.—By Richard C. Cabot, M.D. Third Edition, Revised. Octavo of 709 pages, 254 illustrations. Price $9.00 net. Published by W. B. Saunders Company, Philadelphia. Toronto Agents—The J. F. Hartz Company.

Epidemic Encephalitis—By Arthur J. Hall, M.A., M.D. Camb., F.R.C.P. Lond. 229 pages with 17 plates and other illustrations. Price 12s. net. Published by John Wright and Sons, Ltd., Bristol, England.

Diseases of the Nose, Throat, and Ear—By A. Logan Turner, M.D., F.R.C.S.. 413 pages with 222 illustrations in the text and 12 plates, of which 8 are in colour. Price 20s. net. Published by John Wright and Sons, Ltd., Bristol, England.

Two Lectures on Gastric and Duodenal Ulcer—By Sir Berkeley Moynihan, Leeds. A record of ten years' experience. 48 pages, illustrated. Price 2s 9d post free. Published by John Wright & Sons, Ltd., Bristol, England.

The Human Testis—By Max Thorek, M.D. 548 pages with 308 illustrations. Published by J. B. Lippincott Co., Philadelphia and London.

Hospital Organization and Operation—By Frank E. Chapman, Director, Mount Sinai Hospital of Cleveland. 270 pages, illustrated. Price $4.20. Published by the MacMillan Company of Canada, Ltd., Toronto.

Delirium in Heart Disease. — R. Massini (*Schweiz. med. Woch.*, April 24th, 1924, p. 397) describes two types of delirium which are characteristic of, if not strictly peculiar to, heart disease. The first type he describes as "travelling delirium," the patient believing himself to be in some other place than that in which he actually is. In other respects he may be perfectly sane; he may recognize his doctors and nurses and speak sensibly about his health. One of the author's patients, lying in a hospital in Basel, believed he was in Petersburg, though he could see from his window well known landmarks of Basel. Another patient believed that he was in a hydro or in the home of his brother, in another part of Basel. He recognized the people about him and his speech was perfectly sane, although he could not be convinced of his error of localization. After giving details of a third case illustrating the same phenomenon the author suggests that this "travelling delirium" is a continuation throughout the day of travelling hallucinations by night. The patient is under the impression during the night that he is travelling in a fast train, and that he has reached some distant spot. This hallucination is characterized by its tenacity and uniformity; it may last for days and is always a bad prognosis. The other type of delirium is more rare. The patient sees a definite pattern wherever he looks. It consists of vertical bars or stripes which, in some cases, are crossed by horizontal bars or stripes—a chessboard or window-pane pattern covering every object the patient looks at. These bars appear blue, about 1 cm. wide, and with an interval of about 2 cm. between each bar. The patient may also see printed lines in columns, as in a newspaper, but he cannot read them. As with the first type, this hallucination is unaccompanied by any other evidence of a disordered mind, but the prognosis is not so bad nor the hallucination so persistent. It is possible, but not probable, that this second type may be associated with the administration of digitalis.—*Brit. Med. Jour.*, June, 7, 1924.

Tuberculosis of the Gums.—K. A. Rombach (*Nederl. Tijdschr. v. Geneesk.*, January 12th, 1924, p. 156), who records a case in a girl, aged 8 years, in whom the diagnosis was confirmed by De Groot, director of the Dental School at Utrecht, states that tuberculosis of the gums, though not extraordinarily rare, is an unusual occurrence. The mucous membrane of the gums is hypertrophied, nodular, reddened, and a pressure with a glass slide shows tubercles scattered over it. As a rule the search for tubercle bacilli is fruitless, but inoculation of a guinea-pig produces caseation of the lymph glands showing tubercle bacilli in about six weeks. As regards treatment ultra-violet rays have no good effect, but the old-fashioned treatment with 70 per cent. lactic acid painted on the gums produces a rapid cure, as in Rombach's case. General treatment with codliver oil and iodide of iron should not be forgotten. *Brit. Med. Jour.*, May 24, 1924.